

Code No: 115EQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****GEOTECHNICAL ENGINEERING****(Common to CE, CEE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define the terms (i) Degree of saturation (ii) air content (iii) relative density. [2]
- b) List the common clay minerals and summarize their key properties. [3]
- c) State Darcy's law. Explain the validity of Darcy's law. [2]
- d) Describe the quick sand condition. [3]
- e) Explain stress distribution in soils for concentrated loads by Boussinesq theory. [2]
- f) Differentiate between (i) Standard Proctor test (ii) Modified Proctor test [3]
- g) Define the terms 'Normally consolidated soils', coefficient of volume change', and 'coefficient of compressibility', [2]
- h) What is the pre-consolidation pressure? [3]
- i) Discuss the characteristics of Mohr's circle. [2]
- j) Explain the classification of shear tests based on drainage conditions. [3]

PART - B**(50 Marks)**

- 2.a) Explain the soil formation and soil types.
- b) Explain the terms porosity, void ratio and degree of saturation. 1 m^3 of wet soil weighs 20 kN. Its dry weight is 18 kN. Specific gravity of solids is 2.67. Determine the water content, porosity, void ratio and the degree of saturation. Draw a phase diagram. [5+5]

OR

- 3.a) An undisturbed saturated specimen of clay has a volume of 18.9 cm^3 and a mass of 30.2 g. on oven drying, the mass reduces to 18.0 g. the volume of dry specimen as determined by displacement of mercury is 9.9 cm^3 . Determine shrinkage limit, specific gravity, shrinkage ratio and volumetric shrinkage.
 - b) Explain sensitivity, thixotropy and activity. The insitu void ratio of a granular soil deposit is 0.50. the maximum and minimum void ratios of the soil were determined to be 0.75 and 0.35. $G_s = 2.67$. Determine the relative density of the deposit. [5+5]
- 4.a) Explain Capillarity in soils. Calculate the approximate height of capillary rise in a soil having $e = 0.75$, $D_{10} = 0.05 \text{ mm}$ (assume $C = 25$). What is the value of capillary tension?
 - b) A 5 m thick sand layer ($G_s = 2.67$, $e = 0.6$) is underlain by a bed of 4 m clay ($\gamma_{\text{sat}} = 20 \text{ kN/m}^3$), plot the total, neutral and effective stress distribution upto the bottom of the clay layer, when (i) the water table is at 2 m below ground surface, (take, $S = 50\%$ above the water table) (ii) the water table is at the ground surface. (iii) the water table is 2 m above the ground surface. [5+5]

OR

- 5.a) What are the factors affecting permeability? A horizontal stratified deposit consists of three layers each uniform in itself. The permeability of the layers are 8×10^{-6} m/s, 50×10^{-6} m/s and 15×10^{-4} m/s and their thicknesses are 6 m, 3m and 18m respectively. Find effective average permeability of the deposit in horizontal and vertical direction.
- b) Explain quick sand condition. Give the characteristics of Flow nets. [5+5]

- 6.a) A strip footing 3 m wide is loaded on the ground surface with a pressure at 100 kN/m^2 . A 4m thick soft clay layer exists at a depth of 10 m below the foundation. Find the average increase in vertical stress at the clay layer under the centre line and edge of the building.
- b) Explain Newmark's chart for finding vertical stresses. [5+5]

OR

- 7.a) During a compaction test, a soil attains MDD of 18.6 kN/m^3 at a moisture content of 15%. Taking specific gravity of soils as 2.7, find the degree of saturation and percentage air voids at MDD. What will be the dry density corresponding to zero air voids at OMC. How does compaction improve the engineering properties of soils?
- b) An elevated structure with a total weight of 10,000 kN is supported on a tower with 4 legs. The legs rest on piers located at the corners of a square 6 m on a side. What is the vertical stress increment due to this loading at a point 7 m beneath the centre of the structure? Explain Westergaard's Equation. [5+5]

- 8.a) A 8 m thick clay layer with single drainage settles by 120 mm in 2 years. The coefficient of consolidation for this clay was found to be $6 \times 10^{-3} \text{ cm}^2/\text{s}$. Calculate the likely ultimate consolidation settlement and find out how long it will take to undergo 90% of the settlement.
- b) Explain Terzaghi's 1-D consolidation theory. [5+5]

OR

- 9.a) A clay soil, tested in a consolidometer, showed a decrease in void ratio from 1.20 to 1.10 when the pressure was increased from 0.25 to 0.50 kgf/cm^2 . Calculate the coefficient of compressibility and the coefficient of volume compressibility. If the coefficient of consolidation determined in the test for the given stress increment was $10 \text{ m}^2/\text{year}$, calculate the coefficient of permeability in cm/s . If the samples tested at the site was taken from a clay layer 3 m in thickness, determine the consolidation settlement resulting from the given stress increment.
- b) Explain height of solids and change in void ratio method for computing equilibrium void ratio. [5+5]

- 10.a) Explain the stress-strain and volume change behaviour of sands.
- b) Triaxial test carried out on a partially saturated clay gave $c' = 20 \text{ kN/m}^2$ and $\phi' = 22^\circ$. If the pore pressure parameters for the clay A and B were 0.45 and 0.8 respectively, calculate the pore pressures in a specimen of clay at the beginning and end of each of the two stages of one of the test. (i) Consolidation stage when the cell pressure was 150 kN/m^2 (ii) shear stage with a cell pressure raised to 300 kN/m^2 . [5+5]

OR

- 11.a) In an insitu vane shear test on a saturated clay, a torque of 35 Nm was required to shear the soil. The diameter of the vane was 50 mm and length 100 mm. Calculate the undrained shear strength of the clay. The vane was then rotated rapidly to cause remoulding of the soil. The torque required to shear the soil in the remoulded state was 5 Nm. Determine the sensitivity of the clay
- b) Explain direct shear test and unconfined compression test. [5+5]

Code No: 115EH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****OPERATING SYSTEMS****(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75**

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Distinguish between symmetric and asymmetric multi processor systems. [2]
- b) Define the essential properties of Interactive operating systems and Network operating systems. [3]
- c) What is a dispatcher process? Explain its role. [2]
- d) Describe the differences between preemptive scheduler and non-preemptive scheduler. [3]
- e) What is the need of dynamic loading and dynamic linking? [2]
- f) Explain the differences between internal fragmentation and external fragmentation. [3]
- g) Define mounting. What is the need for mounting in a file system? [2]
- h) What are the typical operations that can be performed on directory? [3]
- i) What is deadlock? What is starvation? How do they differ from each other? [2]
- j) What are the various methods for protection and access control? [3]

PART - B**(50 Marks)**

- 2.a) Explain briefly about virtual machines and micro Kernels. [5+5]
- b) Define operating system goals from user's view and system's view. [5+5]

OR

3. What are the major activities of an operating system with regard to file management? Explain them briefly with their supporting system calls. [10]

4. Following is the snapshot of a CPU

Process	CPU Burst	Arrival Time
P1	75	0
P2	40	10
P3	25	10
P4	20	80
P5	45	85

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining Time First) and RR (Round Robin with time quantum 15) scheduling algorithms. [10]

5. What is a monitor? Explain how dining philosopher's problem is solved using monitors with example pseudo code. [10]

6. Explain the common techniques for structuring the page table. [10]

OR

7.a) Consider a swapping system in which memory consists of the following hole sizes in memory order: 10 KB, 4 KB, 20 KB, 18 KB, 7 KB, 9 KB, 12 KB, and 15 KB. Which hole is taken for successive segment requests of: (i) 12 KB (ii) 10 KB (iii) 9 KB for first fit, best fit, worst fit, and next fit approaches. [5+5]

b) Explain briefly about LFU Page replacement algorithm. [5+5]

8. Explain the following with relevant diagrams:
 a) Two level directory structure. [5+5]
 b) Acyclic-graph directory structure.

OR

9.a) Explain any two methods used to protect user files with examples. [5+5]
 b) Discuss the log-structured file system implementation.

10. Consider the following snapshot of a system:

Processes	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	0 0 1 2	0 0 1 2	2 1 0 0
P1	2 0 0 0	2 7 5 0	
P2	0 0 3 4	6 6 5 6	
P3	2 3 4 5	4 3 5 6	
P4	0 3 3 2	0 6 5 2	

Answer the following questions using the banker's algorithm:

- What is the content of the matrix Need?
- Is the system in a safe state? Why?
- Is the system currently deadlocked? Why or why not?
- Which process, if any, or may become deadlocked if this whole request is granted immediately? [2+3+2+3]

OR

11. In the capability-based system, describe the techniques, which can be used to protect the capabilities from unauthorized modification. [10]

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Code No: 115DU

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

CONTROL SYSTEMS ENGINEERING

(Common to ECE, ETM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
 Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Give the Mason's Gain formula. [2]
- b) List out the classification of control systems. [3]
- c) What is meant by un-damped response? [2]
- d) Write the effects of proportional derivative systems on second order response. [3]
- e) What is the need of angle of asymptotes in Root-locus? [2]
- f) Write the remedies if an entire row is zero while computing elements in R-H array. [3]
- g) Draw the pole-zero plot of Lag compensator. [2]
- h) Define gain-cross over frequency and phase-cross over frequency. [3]
- i) Draw the state diagram of a state model. [2]
- j) What is meant by diagonalization? Explain. [3]

PART - B

(50 Marks)

- 2.a) Discuss the characteristics of feedback in closed loop control system.
- b) Define the Impulse response of the system. Also find the impulse response of the system with open loop transfer function. [5+5]

$$G(s) = \frac{10}{s(s+3)}$$

OR

3. Obtain the transfer function $\frac{Y(s)}{R(s)}$ for the following block diagram (figure 1): [10]

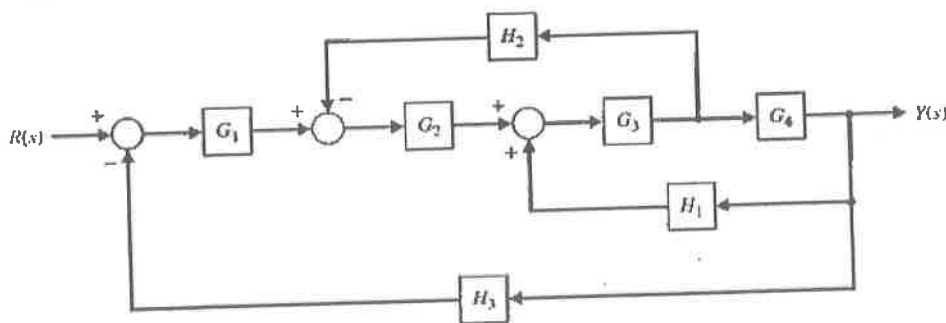


Figure 1

- 4.a) Sketch the time response of the following figure 2 first order system when excited with unit step input.

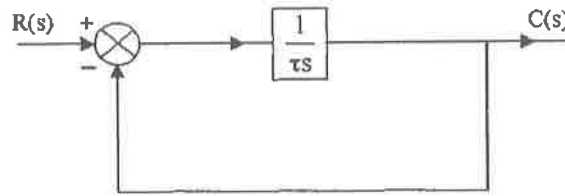


Figure 2

- b) A second order system has a transfer function $G(s) = \frac{25}{(s^2 + 8s + 25)}$, Determine the settling time and peak overshoot when the system is excited with unit step input. [5+5]

OR

- 5.a) Find the steady state errors for the unit step, unit ramp and unit parabolic inputs for the system whose transfer function is $G(s) = \frac{1000(s+1)}{(s+10)(s+50)}$

- b) Discuss the significance of 'type' and 'order' of the system in time response analysis. [6+4]

6. Define Root locus and explain procedure to sketch the Root Locus for a given transfer function. [10]

OR

- 7.a) Comment on system stability if the characteristic equation of closed loop system is $Q(s) = s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$

- b) A unity feedback system with open loop transfer function $G(s) = \frac{K}{s(s+1)}$. Determine the range of 'K' for which system to be stable. [5+5]

8. Sketch the Bode plot for the unity feedback system with open loop transfer function

$$G(s) = \frac{80}{s(s+2)(s+20)}$$

- Also find its gain margin and phase margin. [10]

OR

- 9.a) State and explain Nyquist stability criterion.

- b) What is PID controller and write its merits and demerits. [5+5]

- 10.a) What is state transition matrix and derive its expression.

- b) Obtain the state model for the system which is described as

$$\frac{d^2y}{dt^2} + 5 \frac{dy}{dt} + 10y(t) = 5u(t)$$

Here, 'y' is output variable and 'u' is input variable. [4+6]

OR

- 11.a) Explain the concept of controllability and observability.

- b) Write the advantages of state space analysis over transfer function approach. [5+5]

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R13

Code No: 115EF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****MANAGEMENT SCIENCE****(Common to AE, EEE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What is the importance of Controlling function of Management? [2]
- b) With appropriate examples explain how Departmentalization can be adopted by an Organization? [3]
- c) What are the phases in Product Life Cycle? [2]
- d) What are symbols used for recording operations in production planning? [3]
- e) How is promotion different from Transfer? [2]
- f) How is Job analysis different from Job evaluation? [3]
- g) What is the significance of Dummy activities? [2]
- h) List out the rules for network construction. [3]
- i) Differentiate 'Vision' from 'Mission'. [2]
- j) What is Bench Marking and how does it benefit an Organization? [3]

PART - B**(50 Marks)**

2. Explain in detail behavioral approach as an effective tool for attending Managerial problems. [10]
- OR**
3. What do you understand by 'Delegation'. Explain the process of Delegation and point out its advantages? Explain the barriers to effective Delegation. [10]
 4. Name the various types of Production systems and critically evaluate each of them. To what type of production activities each of them are best suited? [10]
- OR**
5. With the help of neat diagrams, explain the following terms:
 - a) Economic Order quantity;
 - b) Lead time;
 - c) Safety stock;
 - d) Reordering point
 - e) Average inventory. [10]

- 6.a) What are the objectives of Human Resources Management? [5+5]
 b) Discuss the various factors that influence the selection of Training methods. [5+5]

OR

- 7.a) Distinguish between 'Performance Appraisal' and 'Merit Rating'. [5+5]
 b) Critically evaluate different methods of Performance Appraisal.

8. The following table lists the jobs of a network along with the time estimates (in no. of days)

Job	optimistic	Most likely	pessimistic
1-4	3	9	27
1-3	3	6	15
1-2	6	12	30
4-5	1	4	7
3-5	3	9	27
3-6	2	5	8
5-6	6	12	30
2-6	4	19	28

Draw the network and determine project completion time. [10]

OR

- 9.a) Distinguish between Event and Activity.
 b) Distinguish between Variance and standard deviation in project management.
 c) Distinguish between Cost slope for project completion time. [3+4+3]
10. Elaborate the 'Strategic Management' process and explain the mechanism you would adopt so that the right strategic plan is formulated? [10]

OR

11. Answer briefly the following:
 a) Environmental scanning and its purpose
 b) Balanced score card. [5+5]

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Code No: 115CG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

MECHANICS OF FLUIDS AND HYDRAULIC MACHINES

(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What do you mean by dimensions and units? [2]
- b) List out different fluid properties along with their significance. [3]
- c) What do you mean by rotational and irrotational flows? [2]
- d) Distinguish between fluid Kinematics and Fluid Dynamics. [3]
- e) Distinguish between Orifice meter and venture meter. [2]
- f) What are laminar and turbulent boundary layers? [3]
- g) Differentiate pump and turbine. [2]
- h) What is geometric similarity? [3]
- i) How do you distinguish centrifugal and reciprocating pumps? [2]
- j) What is indicator diagram? What is its significance? [3]

PART - B**(50 Marks)**

- 2.a) Explain Newtonian and Non-Newtonian fluids, vapour pressure, and compressibility.
 - b) A piston 796 mm diameter and 200 mm long works in a cylinder of 800 mm diameter. If the annular space is filled with lubrication oil of viscosity 5 cp (centi-poise), calculate the speed of descent of the piston in vertical position. The weight of the piston and axial load are 9.81 N. [5+5]
- OR**
- 3.a) What is the difference between U-tube differential manometers and inverted U-tube differential manometers. Where are they used?
 - b) An open tank contains water up to a depth of 1.5 m and above it an oil of sp.gr.0.8 for a depth of 2 m. Find the pressure intensity: (i) at the interface of the two liquids, and (ii) at the bottom of the tank. [5+5]
- 4.a) Derive Bernoulli's equation for the flow of an incompressible frictionless fluid from consideration of momentum.
 - b) A 45° reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 40 cm and 20 cm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet of bend is 21.58 N/cm². The rate of flow of water is 500 litres/s. [5+5]
- OR**
- 5.a) What is the difference between momentum equation and impulse momentum equation.
 - b) A 30 cm diameter pipe carries water under a head of 15 metres with a velocity of 4 m/s. If the axis of the pipe turns through 45°, find the magnitude and direction of the resultant force at the bend. [5+5]

- 6.a) Show that the loss of head due to sudden expansion in pipe line is a function of velocity head.
- b) The rate of flow of water through a horizontal pipe is $0.3 \text{ m}^3/\text{s}$. The diameter of the pipe is suddenly enlarged from 250 mm to 500 mm. The pressure intensity in the smaller pipe is 13.734 N/cm^2 . Determine: (i) loss of head due to sudden enlargement, (ii) pressure intensity in the large pipe and (iii) power lost due to enlargement. [5+5]

OR

- 7.a) What is a pitot-tube. How will you determine the velocity at any point with the help of pitot-tube.
- b) A $30 \text{ cm} \times 15 \text{ cm}$ venturimeter is inserted in a vertical pipe carrying water, flowing in the upward direction. A differential mercury-manometer connected to the inlet and throat gives a reading of 30 cm. Find the discharge. Take $C_d = 0.98$. [5+5]
- 8.a) Define and explain hydraulic efficiency, mechanical efficiency and overall efficiency of a turbine.
- b) A Kaplan turbine runner is to be designed to develop 7357.5 kW S.P. The net available head is 10 m. Assume that the speed ratio as 1.8 and flow ratio 0.6. If the overall efficiency is 70% and diameter of the boss is 0.4 times the diameter of the runner, find the diameter of the runner, its speed and specific speed. [5+5]

OR

- 9.a) Draw a net sketch of a Pelton wheel installation and briefly indicate the functions of each component.
- b) A double jet Pelton wheel develops 1200 MHP with an overall efficiency of 82% under a head of 60 m. The speed ratio = 0.46, jet ratio = 12, and the nozzle coefficient = 0.97. Find the jet diameter, wheel diameter and wheel speed in rpm. [5+5]
- 10.a) What precautions are to be taken while starting and closing the pump.
- b) A centrifugal pump delivers 300 lps of water against a head of 5 m when running at 510 rpm. At what speed should a geometrically similar pump run when delivering 150 lps at a head of 10m. Determine the ratio of linear dimensions of the pump. [5+5]

OR

- 11.a) Discuss the conditions under which cavitation and negative slip occur and state why air vessels are used in reciprocating pumps.
- b) A centrifugal pump is required to deliver 300 lit of water per second against a head of 14 m. If the vanes of the impeller are radial at outlet and the velocity of flow is constant equal to 2m/sec, find the proportions of the pump. Assume manometric efficiency as 75% and the ratio of breadth to diameter at outlet as 0.1. [5+5]

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Code No: 55005

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

WATER RESOURCES ENGINEERING-I

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain different methods of estimating missing data at any given rain gauge.
 b) The normal annual precipitation of five rain-gauge stations are 1250, 1050, 750, 1135 and 1380 mm respectively. During a particular storm, the precipitation recorded at the first four stations is 130, 95, 70 and 100 mm respectively. Estimate the rainfall at the fifth station during the storm. [7+8]
- 2.a) Explain the concept of Depth-area-duration (DAD) analysis and draw a typical DAD curve.
 b) Give the procedure for developing Intensity-Duration-Frequency (IDF) curves by analytical and empirical methods. [7+8]
- 3.a) Give the steps involved for development of unit hydrograph from single storm hydrograph.
 b) The ordinates of a hydrograph of surface runoff resulting from 48 mm of rainfall excess of duration 8 hr in a catchment are given below:

Time(hr)	0	6	12	18	24	30	36	42	48	54	60	90	100	115	140
Discharge m^3/s	0	50	200	400	600	800	1150	1400	1500	1400	1200	650	500	300	0

- Determine the ordinates of an 8hr unit hydrograph for this basin. [7+8]
- 4.a) Write short notes on :
 i) Well Perforations
 ii) Well revitalization
 iii) Well efficiency
 b) What are the various considerations for the selection of a suitable site for an open well? [7+8]
- 5.a) Derive a formula for determining the time required to cover a given area of the strip.
 b) Determine (i) the time required to irrigate an area of 0.7 hectares and (ii) the maximum area that can be irrigated from a tube-well with a discharge of $0.035 m^3/s$. The infiltration capacity of the soil may be taken as 50 mm/hour and average depth of flow of water as 150 mm. [7+8]

6. Explain the following terms

- a) Delta
- b) Base period
- c) Frequency of irrigation
- d) Paleo
- e) Kor depth and Kor period
- f) Number of watering.

[15]

7.a) Explain the steps in the design of canals by Lacey's method.

b) Design a channel section by Kennedy's theory given

$$B/D \text{ ratio} = 5:7$$

$$S = 1 \text{ in } 5000$$

$$N = 0.0225$$

Also determine the discharge carried by the canal.

[7+8]

8.a) Explain the importance of Antecedent moisture content in the estimation of runoff using SCS-CN method.

b) What is the use of rational method and where it is useful?

[8+7]

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Code No: 55021

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****COMPUTER ORGANIZATION****(Common to ECE, ETM)****Time: 3 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

1. Explain the following terms with respect to cache
 - a) Locality of reference
 - b) Memory Interleaving
 - c) Miss penalty
 - d) prefetching
 - e) Write buffer. [15]
- 2.a) Draw the circuit diagram of 4×4 FIFO buffer and explain its functionality.
b) Explain interrupt initiated I/O. [8+7]
3. Explain four possible hardware schemes that can be used in an instruction pipeline in order to minimize the performance degradation caused by instruction branching. [15]
- 4.a) Discuss the difference between tightly coupled and loosely coupled multi-processors from the view point of hardware organization and programming techniques.
b) What is meant by snoopy cache? Will it address cache coherence problem in shared memory systems. [8+7]
- 5.a) With examples explain IEEE floating point representation.
b) How to measure performance of a computer system? Explain.
c) Discuss 4-bit gray code and reflection of gray code. [5+5+5]
6. With illustrations explain the four types of micro operations performed by computer system. [15]
- 7.a) What is a microprogram sequencer? Discuss the sequencing capabilities required in a control storage.
b) Differentiate between horizontal and vertical micro instruction formats. [8+7]
- 8.a) Multiply -17 with +9 using Booth's multiplication algorithm.
b) With flowchart explain division on floating point numbers. [8+7]

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Code No: 55026

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

OPERATIONS RESEARCH

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

1. a) Define linear programming problem. Give example.
 b) A dietician recommends the minimum daily (quantity) requirement of the vitamins A, B and C for a health conscious customer to be 30, 20 and 16 units, respectively. For the supply of these minimum vitamin requirements, the customer relies on two types of foods X and Y. The food X provides 7, 5, 2 units of the three vitamins per gram, respectively, while the food Y provides 2, 4, 8 units of the same three vitamins per gram of the food, respectively. The food X costs Rs. 30 per gram and the food Y Rs. 20 per gram. The problem is to determine the optimum mix of the foods X and Y which the dietician can recommend so as to maximize food richness and minimize the possible bill to the customer. Formulate the problem as LPP. [7+8]
2. Determine the optimum basic feasible solution to the following Transportation problem. [15]

		To			
		A	B	C	Available
From	1	50	30	220	1
	2	90	45	170	3
	3	250	200	50	4
	Required	4	2	2	

3. a) What is meant by restricted (or prohibited) assignment? Explain how you can solve the AP in such case.
 b) How do you apply assignment in the case of allocating crew in transport agencies/ railways/ airways etc. [7+8]
4. a) Explain No passing rule with reference to sequencing problems.
 b) Find the sequence that minimizes total machining time to complete the following data: [7+8]

Tasks	A	B	C	D	E	F
Time on machine I	4	9	8	5	10	9
Time on machine II	5	4	3	6	2	5
Time on machine III	7	8	6	12	6	7

5. a) Define Bellman's principle of optimality and its application to DPP.
 b) Use dynamic programming to [7+8]
 Max $Z = 2x_1 + 3x_2$
 Subject to constraint
 $x_1 + x_2 \leq 1$
 $x_1 + x_2 \leq 3$
 $x_1 + x_2 \geq 0$ and
 $x_1, x_2, x_3 \geq 0$

- 6.a) Distinguish between the games with saddle points and games without saddle points.
 b) Solve the following game graphically. [7+8]

		Player B	
		1	-3
		3	5
		-1	6
Player A	4	1	
	2	2	
	-5	0	

- 7.a) Describe Machine Life Cycle and maintenance policy with the help of Bath Tub Curve.
 b) Distinguish between gradual failures and sudden failures and their effects. [7+8]
- 8.a) List out the limitations of EOQ.
 b) Rajiv automobiles have to supply its customers 24,000 units of its product per year. This demand is fixed and known. The customer has no storage space and so the manufacturer has to transport a day's supply each day. If the manufacturer fails to supply, the penalty is Rs. 0.20 per unit per month. The inventory holding cost amounts to Rs. 0.10 per month and the set-up cost is Rs. 350 per production run. Find the optimum lot size of the manufacturer. [7+8]

---ooOoo---

Code No: 55079

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****DESIGN OF MACHINE ELEMENTS****(Automobile Engineering)****Time: 3 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) What materials are used and mention Their proportions in manufacturing the following parts ?
i) Crank shaft . ii) bushed bearing .
iii) Worm and worm wheel iv) cylinder block of automobile
- b) Design a shaft, required to transmit 100 KW at 200 rpm. The shear stress in the shaft should not exceed 80MPa and the maximum torque exceeds the mean by 30%. Find the angle of twist over a length of 2.5m, Take $E=90\text{Gpa}$. [7+8]
- 2.a) What are the various factors influence the endurance limit of a ductile material ?
- b) Determine the size of Piston rod subjected to a total load of having cyclic fluctuations from 20 KN in compression to 30KN in tension. The endurance limit is 400 MPa and yield strength is 450 MPa Take impact factor = 1.2 and factor of safety =1.5 surface factor =0.85, stress concentration factor as 2.5. [7+8]
- 3.a) Differentiate between Riveted and welded Joint.
- b) A double riveted lap Joint is made between 16mm their plates. The rivet dia and pitch are 24mm and 70mm respectively. If the ultimate stresses are 400 MPa in tension, 300 MPa in shear and 600 MPa in crushing, find the maximum force per pitch which will respecter the Joint. If this Joint is subjected to a load such the factor of safety is 4. Find the actual stresses developed in the plate and rivet. [7+8]
4. A shaft made of mild steel is required to transmit 120KW at 400 rpm. The supported length of shaft is 4m and carries two pulleys each weighing 1200 N, supported at a distance of 1 metre from the ends. Assuming safe value of stress of 60 MPa, determine the diameter of shaft. [15]
- 5.a) How the Helical Torsional springs are used in practice?
- b) A helical spring is made from a wire of 8 mm. dia and has outside dia of 80mm. If the permissible stress is 400 MPa and modulus of rigidity is 84 KN/mm^2 , find the axial load which the spring can carry and defection per active turn. [7+8]
- 6.a) What are rolling contact bearings and mention their advantages over sliding contact bearings?
- b) The main bearing of steam engine is 120mm dia and 200 mm long. The bearing supports a load of 30 KN at 300 rpm. If the ratio of diametral clearance to the diameter is 0.001 and the absolute viscosity of the oil is 0.02 kg /m –sec, find the coefficient of friction. [7+8]

7. Design a crankshaft with the following data piston dia -250 mm, stroke -380mm, maximum combustion pressure - 3 N / mm^2 ; weight of flywheel - 18 KN. Total belt pull - 3KN, length of connecting rod 1000 mm. When the crank had turned through 30° from the top dead centre, the pressure on the piston is 1 N / mm^2 and the torque on the crank at this point is maximum. [15]

8. What are the various forces coming on to the piston and explain about the design and manufacture of cylinder liners? [15]

---ooOoo---

R13

Code No: 115AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****ENGINEERING GEOLOGY****(Civil Engineering)****Time: 3 hours****Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define Weathering and its types. [2]
- b) Mention disadvantage of clay soil. [3]
- c) Mention the physical properties of Quartz. [2]
- d) Discuss the classification of igneous rock. [3]
- e) Differentiate fault zone and shear zone. [2]
- f) List out different causes of Landslide. [3]
- g) Mention the different types of aquifers. [2]
- h) What are the different types of Dams? [3]
- i) What is impact of water table on tunneling? [2]
- j) Discuss different types of tunnels. [3]

PART - B**(50 Marks)**

- 2.a) With a neat sketch, explain the erosional action of Wind. [5+5]
 - b) Mention different river erosional processes.
- OR**
- 3.a) With a suitable sketch, explain the rock cycle. [5+5]
 - b) Give the classification of different types of drainage patterns.
4. With Suitable example, explain the physical properties of minerals. [10]
- OR**
- 5.a) Give the physical properties of Mica. [5+5]
 - b) Draw the mechanical structure of sedimentary rock.
- 6.a) Mention the different classification of earthquake. [5+5]
 - b) Give the classification of fold depending on its axial plane.
- OR**
- 7.a) Give the detailing of earthquake measurement using seismograph. [5+5]
 - b) Draw the sketch of different types of fold.

- 8.a) With a suitable sketch, explain the electrical resistivity survey. [5+5]
b) Mention the seismic survey methods.

OR

9. Discuss in detail, different geophysical prospecting methods. [10]

- 10.a) Discuss different purposes of tunneling.
b) Explain in detail the geological consideration of tunneling. [5+5]

OR

- 11.a) Mention the topographical consideration for dam construction and explain.
b) Mention the advantages of RS and aerial photography for different civil engineering surveying. [5+5]

---ooOoo---

Code No: 115AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

CONTROL SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What type of feedback is employed in control system? [2]
- b) What are the basic elements used for modelling mechanical rotational system? [3]
- c) Give the advantages of transfer function. [2]
- d) Write the analogous electrical elements in force voltage analogy for the elements of mechanical translational system. [3]
- e) What is the difference between type and order of a system? [2]
- f) What is steady state response? [3]
- g) Define stability. [2]
- h) What is Routh stability criterion? [3]
- i) Define Phase cross over. [2]
- j) Write short notes on the correlation between the time and frequency response. [3]

PART - B

(50 Marks)

- 2.a) When is a control system said to be robust? Explain with suitable example. [5+5]
- b) Describe the open loop and closed loop control system.

OR

- 3.a) Find the impulse response of the system described $G(s) = \frac{2}{s^2 + 2s + 6}$, $H(s) = \frac{1}{s + 2}$.

- b) List the advantages and disadvantages of feedback systems. [5+5]

4. Describe a two phase a.c. servomotor and derive its transfer function. [10]

OR

5. A servo system is represented by the signal flow graph shown in Figure 1. The nominal values of the parameters are $K_1 = 1$, $K_2 = 5$ and $K_3 = 5$. Determine the overall transfer function $\frac{Y(s)}{R(s)}$ and its sensitivity to changes in K_1 under steady dc conditions, i.e.,

$$s = 0.$$

[10]

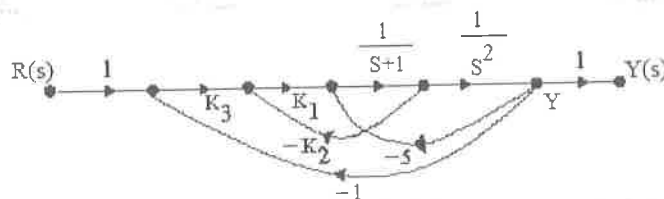


Figure 1

6. The open loop transfer functions of three systems are given as

a) $\frac{4}{(s+1)(s+2)}$

b) $\frac{2}{s(s+4)(s+6)}$

c) $\frac{5}{s^2(s+3)(s+10)}$

Determine respectively the positional, velocity and acceleration error constants for these systems. Also for the system given in determine the steady state errors with step

input $u(t)=1$; ramp input $r(t) = t$ and acceleration input $r(t) = \frac{1}{2}t^2$. [10]

OR

7. Obtain the unit – step response of a unity feedback control system whose open –loop transfer function is $G(s) = \frac{1}{s(s+1)}$. Obtain also the rise time, peak time, maximum overshoot and settling time. [10]

8. For unity feedback system given by $G(s) = \frac{K}{s(s+0.5)(s^2+0.6s+10)}$

a) Find the stability using RH criterion

b) for stable system find the range of K value. [8+2]

OR

9. Sketch the root loci for the system shown in Figure 2. [10]

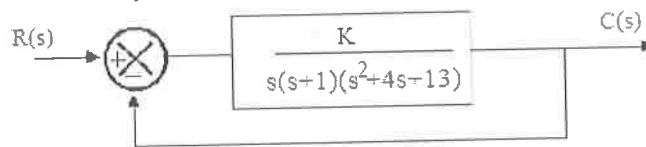


Figure 2.

10. The forward path transfer function of a Unity-feedback control system is given as

$$G(s) = \frac{K}{s(1+0.1s)(1+0.5s)}$$

Draw the Bode plot of $G(s)$ and find the value of K so that the gain margin of the system is 20 db. [10]

OR

11. Consider the system shown in Figure 3. Draw the Bode-diagram of the open-loop transfer function $G(s)$ with $K = 1$. Determine the phase margin and gain margin. Find the value of K to reduce the phase margin by 10° . [10]

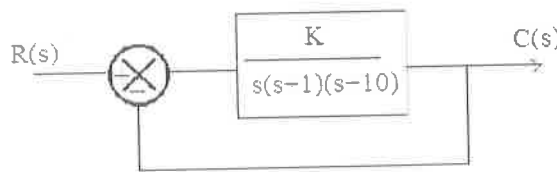


Figure 3.

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Code No: 115AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

COMPILER DESIGN

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Write a brief note on bootstrap process. [2]
- b) What are the differences between a compiler and an interpreter? [3]
- c) Give the specification of the YACC parser generator. [2]
- d) Construct the LR(0) items for the "dangling-else" grammar. [3]
- e) How to check structural equivalence of two type expressions? [2]
- f) Define and write the differences between synthesized attributes and inherited attributes. [3]
- g) Write a short note on Flow graph. [2]
- h) Write an algorithm for constructing a basic block. [3]
- i) Define various possible outputs of the code generator. [2]
- j) Construct DAG for the following basic block: [3]
 - T1=A+B
 - T2=C+D
 - T3=E - T2
 - T4=T1- T3

PART - B

(50 Marks)

- 2.a) Explain various error recovery strategies in lexical analysis.
 - b) Construct a Finite Automata and Scanning algorithm for recognizing identifiers, numerical constants in C language. [5+5]
- OR**
3. Explain the various phases of a compiler with an illustrative example. [10]
 4. Construct the LR Parsing table for the following grammar: [10]
 - $E \rightarrow E + T \mid T$
 - $T \rightarrow T * F \mid F$
 - $F \rightarrow (E) \mid id$
- OR**
- 5.a) Write a YACC program that will take regular expression as input and produce its parse tree as output.
 - b) Write an algorithm for computing LR(k) item-sets. [5+5]

- 6.a) Write an SDT to convert infix to postfix expression. [5+5]
b) Explain briefly about polymorphic functions. [5+5]
- OR**
7. Explain various storage allocation strategies with its merits and demerits. [10]
8. Discuss various techniques of function preserving transformations for code optimization. [10]
- OR**
9. Explain how data flow equations are set up and solved for improving code. [10]
10. Explain the following peephole optimization techniques: [5+5]
a) Elimination of Redundant Code
b) Elimination of Unreachable Code.
- OR**
11. Explain in detail about machine dependent code optimization techniques with their drawbacks. [10]

---ooOoo---

435

Code No: 115EN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****COMPUTER ORGANIZATION AND OPERATING SYSTEMS**

(Common to ECE, ETM)

Time: 3 hours**Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) A digital computer has a common bus system for 16 registers of 32 bits each. The bus is constructed with multiplexers. How many selection inputs are there in each multiplexer? [2]
- b) Give one example for Arithmetic Micro Operations, Logic Micro Operations and Shift Micro Operations. [3]
- c) What is the difference between hardwired control and a micro programmed control? [2]
- d) Differentiate between SRAM and DRAM. [3]
- e) Why bus arbitration is required? [2]
- f) In a computer system, why a PCI bus is used? [3]
- g) What is the purpose of paging the page tables? [2]
- h) Why do some operating systems store the operating system in firmware, while others store it on disk? [3]
- i) List the operations on a file. [2]
- j) Give a note on indexed allocation of disk space. [3]

PART - B**(50 Marks)**

- 2.a) Explain how floating point numbers are represented.
- b) What is an Addressing mode? List and explain the various addressing modes with an example. [2+8]

OR

- 3.a) Design a 4 bit combinational circuit decrement using four full adder circuits.
- b) Explain with an example Booth's algorithm for multiplication of signed 2's complement numbers. [5+5]

4. With a neat block diagram, explain in detail about micro programmed control unit and explain its operations. [10]

OR

- 5.a) A block set associative cache consists of a total of 64 blocks divided into 4 blocks sets. The main memory contains 4096 blocks, each consisting of 128 words.
 - i) How many bits are there in main memory address?
 - ii) How many bits are there in each of the TAG, SET, and WORD fields?
- b) Give a brief note on RAID. [4+6]

- 6.a) Using block diagram explain the working of DMA Controller.
- b) When a device interrupt occurs, how does the processor determine which device issued the interrupt? Explain. [5+5]

OR

7. What is the basic advantage of using interrupt-initiated data transfer over transfer under programmed control without an interrupt? Explain interrupt-initiated I/O in detail. [10]
- 8.a) How network computers differs from traditional personal computers? Describe some usage scenarios in which it is advantageous to use network computers.
- b) Is it possible to have a deadlock involving only a single process? Justify your answer. [5+5]

OR

- 9.a) Describe the three general methods for passing parameters to the operating system.
- b) What is the purpose of the command interpreter? Why is it usually separate from the kernel? [5+5]
10. Why do some systems keep track of the type of a file, while others leave it to the user and other simply do not implement multiple file types? Which system is better? Explain in detail. [10]

OR

- 11.a) In What situations would use memory as a RAM disk be more useful than using it as a disk cache?
- b) Give a brief note on free space management. [5+5]

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271

Code No: 215AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy III Year I Semester Examinations, November/December-2016

PHARMACEUTICAL ANALYSIS-I

Time: 3hours

Max.Marks:75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks; Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

1.a) Express the following result in correct number of significant figures: [2]

$$i) \frac{35.63 \times 0.5418 \times 0.0530 \times 100}{1.1688} =$$

$$ii) \begin{array}{r} 6.6 \\ +18.74 \\ +0.766 \\ \hline \hline \end{array}$$

- b) What are indicators? Classify redox indicators with examples. [3]
 c) Write ideal properties of metal ion indicators. [2]
 d) Classify the solvents used in non-aqueous titration with two examples for each class. [3]
 e) Name the indicator and reference electrode used in potentiometric redox titrations. [2]
 f) List the applications of conductometric measurements other than conductometric titrations. [3]
 g) A sample and standard moved to 8 cm distance. The solvent front moved to 10 cm distance. Calculate R_x of the sample. [2]
 h) Write advantages of chromatography as separation technique. [3]
 i) Write the principle of flame photometry. [2]
 j) Write the applications of Nephelo-turbidometric analysis. [3]

PART-B**(50 Marks)**

- 2.a) Explain the rules for significant digits in numbers and rounding off in brief
 b) Explain the Lowry Bronsted and Lewis concept of acid and bases. [5+5]

OR

- 3.a) Derive Henderson Hasselbalch equation.
 b) Explain various correction factors employed in calibration of a glass apparatus in brief. [5+5]
- 4.a) Describe the types of complexometric titrations in brief.
 b) Write any three important conditions for precipitation.
 c) Write the preparation of 250ml of 0.125M disodium edetate solution as per IP 2010. [5+3+2]

OR

5.a) Define the terms masking and demasking. Explain its importance in complexometric titrations with one example. [5+5]

b) Compare volumetric and gravimetric analysis. [5+5]

6.a) Explain the principle of potentiometric titrations.

b) Write the methods to detect equivalence point in potentiometric titrations. [5+5]

OR

7.a) Write the advantages and disadvantages of Dropping mercury electrode.

b) With two examples, write the principle in amperometric titration. [5+5]

8.a) Write the principle of paper chromatography. Discuss development techniques of paper chromatography.

b) Explain the principle and applications of 2D Paper chromatography. [5+5]

OR

9.a) Explain factors affecting R_f in TLC in brief.

b) Write the precautions to be taken while developing chromatograms in TLC and packing of columns in column chromatography. [5+5]

10.a) Differentiate Turbidometry and Nephelometry.

b) Write the factors affecting specific optical rotation of a solution.

c) A 10%w/v solution of dextrose has an angle of rotation of $+8^\circ$ using 20cm sample tube. Calculate the specific rotation of the same. [5+3+2]

OR

11.a) Explain the interferences in flame photometry in brief.

b) Explain the instrumentation of flame photometer in brief.

c) Write and explain the formula to calculate specific rotation of a liquid. [5+3+2]

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R13

Code No: 115DV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

DESIGN OF MACHINE MEMBERS – I

(Common to ME, AME)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) List any four factors that govern selection of materials while designing a machine component. [2]
- b) Define stress concentration along with its causes. Write any one method to reduce stress concentration. [3]
- c) What is bolts of uniform strength? [2]
- d) What are the reasons of replacing the riveted joints by welded joints in modern equipment? [3]
- e) Define the term throat area of the weld. [2]
- f) Square key is stronger against crushing than rectangular key justify the statement. [3]
- g) With suitable example state when flexible coupling is preferred over the rigid coupling. [2]
- h) Define BIS code? State its application in machine design with suitable example. [3]
- i) If a single spring is cut into 2 equal pieces what will be the stiffness of each individual spring after cutting. [2]
- j) What is nipping? [3]

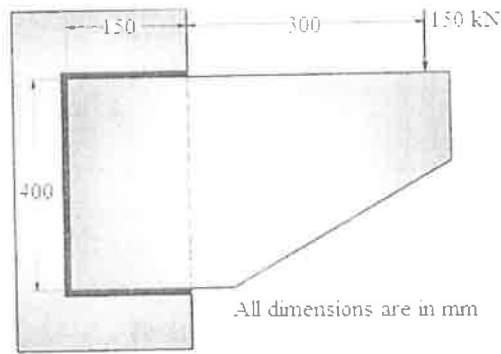
PART - B**(50 Marks)**

- 2.a) Explain the following theories of failure.
 - i) Rankine's Theory
 - ii) Maximum Strain Energy Theory
 - iii) Saint Venant's Theory.
- b) With neat sketch explain how the Soderberg and Goodman lines differ from each other. [6+4]

OR

3. A cantilever of circular cross section is fixed at one end and subjected to completely reversed force of 10 kN at the free end. The force is perpendicular to the axis of the beam. The distance between the free and fixed end is 100 mm. The beam is made up of steel with ultimate tensile strength of 540 N/mm² and tensile yield strength of 320N/mm². The construction of cantilever is such that there is no stress concentration. The size factor, surface finish factor and reliability factor are 0.85, 0.8, and 0.86 respectively. The operating temperature is 50 °C for which the temperature factor is 1.010. If the diameter of the beam is 35mm determine the life of the beam? [10]

4. A bracket plate carrying a load of 150 kN is to be welded to a column as shown in figure find the size of the weld, if the allowable shear stress in the weld is 120MPa. [10]



OR

- 5.a) Explain the 4 possible ways of failures in single rivet with suitable diagram for each case.
- b) A circular bar of 50 mm diameter is welded to a steel plate by an annular fillet and is subjected to a twisting moment of 2 kNm. If the allowable shear stress in the weld material is 85 MPa, determine the size of the weld. [5+5]
- 6.a) A $16 \times 10 \text{ mm}^2$ cross section parallel key is to be used to transmit 60 kW power at 1440 rpm from a shaft of 45mm diameter. The key is made of plain carbon steel with yield strength of 300 N/mm^2 . If the required safety margin is 3, determine the key length.
- b) List out the procedure for designing a knuckle joint stating all the empirical relations involved in it with suitable diagram. [6+4]
- OR**
- 7.a) Kennedy keys are used to transmit 30 kW power at 500 rpm from 40mm diameter shaft to the hub. The keys are made of steel 55C8 with yield strength of 400 N/mm^2 and ultimate tensile strength of 700 N/mm^2 . If the factor of safety required is 3 and overload factor is 1.5 design the keys.
- b) With neat diagram explain the design procedure involved in designing a cotter joint. [6+4]
8. A shaft supported between two bearings 400 mm apart carries an overhanging bevel gear at one end at a distance of 150 mm from the nearest bearing. The pitch circle diameter of bevel gear is 200mm. the tangential, radial and axial forces acting on the bevel gear are 28kN, 9.8kN and 2.9kN respectively. The shaft speed is 600 rpm .the ultimate and yield strengths of shaft material are 280 N/mm^2 and 135 N/mm^2 respectively. The combined shock and fatigue factors in bending and torsion are 1.5 and 1.0 respectively. Determine the shaft diameter also calculate the power transmitted by shaft. [10]

OR

9. A bushed pin type flexible flange coupling is used to transmit 30kW power at 1440 rpm from an electric motor to a machine. If the peak torque is 20% more than the average torque, design the coupling. Assume following permissible stresses for the components of the coupling. Take permissible bearing pressure as 1N/mm^2 . [10]

Type of stress N/mm^2	C.I FLANGE	PLAIN CARBON: STEEL (shaft and key)	ALLOY STEEL (pin)
Allowable tensile stress	20	80	250
Allowable compressive stress	60	80	250
Allowable shear stress	15	35	125

- 10.a) Write a note on short peening in springs.

b) A semi elliptic leaf spring used for an automobile suspension consists of 3 extra full length leaves and 15 graduated leaves including the master leaf. The center to center distance between two eyes of the spring is 1 meter. The maximum force that can act on the spring is 75kN. the ratio of width to thickness for each leaf is 9:1. The leaves are pre stressed in such a way that when the force is maximum the stress induced in all leaves are 450N/mm^2 . If modulus of elasticity is $2.07 \times 10^5\text{N/mm}^2$. Determine

- The cross section of the leaves
- The initial nip
- The initial preload required to close the gap between extra full lengths and graduated leaves. [3+7]

OR

- 11.a) Explain the surging of leaf springs.

b) A composite compression spring has two closed coil helical springs. The outer spring is 15 mm longer than the inner spring. The outer spring has 10 coils of mean diameter 40mm and wire diameter 5 mm. The inner spring has 8 coils of mean diameter 30 mm and wire diameter 4 mm. when the spring is subjected to an axial load of 400 N Find;

- Compression of each spring
- Load shared by each spring
- Shear stress induced in each spring.

Modulus of rigidity may be taken as 84 kN/mm^2 .

[3+7]

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R09

Code No: 55001

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2016
CONCRETE TECHNOLOGY
(Common to CE, CEE)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Briefly explain the basic ingredients of Portland cement and also their ill effects if used in excess.
b) Briefly explain the water requirement for hydration of cement. [8+7]
- 2.a) State four admixtures and mention their uses.
b) Briefly explain the difference between plasticizers and super plasticizers. [8+7]
- 3.a) Define Fineness modulus for blending of aggregates? And what are the Physical Quality requirements of aggregates?
b) What are the various tests which are to be done on aggregates? Explain the effect of size and shape of coarse aggregate in concrete mix. [8+7]
- 4.a) How does increasing the quantity of water influence the properties of fresh and hardened concrete?
b) Explain any two tests for Fresh Concrete. [8+7]
- 5.a) Briefly explain the Relation between compression and tensile strength of hardened concrete.
b) Write a short note on Gel space ratio and Maturity concept of hardened concrete. [8+7]
- 6.a) Write a short note on rebound hammer test and pullout test.
b) What is the difference between nondestructive and semi destructive methods? [8+7]
7. Design a concrete mix, M20 by IS 10262-1982 for the following data. Maximum size of aggregate 20mm, Fine aggregate conforming of zone 3, compaction factor 0.85, Quality control is good, Type of exposure is mild, Water absorption for both the aggregate is 0.1%, free moisture content is 2%, specific gravity of OPC is 3.15 and that both aggregate is 2.7 and slump is 85mm. [15]
- 8.a) Write a short note on light weight concrete. Mention any four naturally occurring and artificial light weight aggregate.
b) Write a short note on current development in Fiber reinforced concrete. [8+7]

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R09

Code No: 55015

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS****(Common to AME, BT, EIE, IT, ME, MCT, MIE, MIM)****Time: 3 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) Define Managerial Economics and explain its scope.
b) What are the elements that influence demand? Explain the salient features of law of demand and its exceptions. [7+8]
- 2.a) Define Elasticity of demand and explain the significance of elasticity of demand.
b) Explain the importance demand forecasting and describe the factors governing demand forecasting. [7+8]
- 3.a) Explain the importance of production function and salient features of Cobb-Douglas Production function.
b) What is opportunity cost? And explain the Explicit Vs. Implicit costs. [7+8]
- 4.a) Explain the salient features of perfect competition and Monopoly.
b) Explain the objectives of pricing and describe any three methods of pricing. [7+8]
- 5.a) Explain the characteristics of business and salient features of partnership.
b) Describe the salient features, advantages and limitations of Joint Stock Companies. [7+8]
- 6.a) Explain the importance of capital and briefly outline the methods of raising finance.
b) ABC Ltd. proposes to acquire a machine for Rs. 6,00,000 details are as follows:
i) Life of the machine = 4 years
ii) Salvage value of the machine at the end of 4 years = Rs. 1,00,000
iii) Income per annum before depreciation and tax = Rs.4,00,000
iv) Tax rate = 50%
v) Cost of capital = 20%
vi) Present value factors @ 20%

Years	P.V. Factor
1	0.833
2	0.694
3	0.579
4	0.482
5	0.402

From the above, compute the Net Present Value of the machine.

[7+8]

- 7.a) Explain the importance of financial accounting and the salient features of Double-entry book keeping.
- b) Prepare a Trial Balance from the following accounting records. [5+10]

Particulars	Rs.
Capital	1,00,000
Machinery	30,000
Stock (1.1.2013)	16,000
Wages	50,000
Carriage inwards	500
Salaries	5,000
Factory rent	2,400
Repairs	400
Fuel and power	2,500
Buildings	40,000
Sundry debtors	20,000
Sales	2,03,600
Purchases	1,22,000
Creditors	12,500
Returns outwards	2,000
Returns inwards	3,600
Drawings	2,000
Discounts allowed	750
Discounts received	250
Office expenses	1,000
Manufacturing expenses	600
Bills payable	8,500
Bills receivable	5,000
Cash in hand	2,400
Cash at bank	15,400
Office rent	1,800

- 8.a) Describe the significance ratio analysis and briefly explain the salient features of activity ratios.
- b) From the following balance sheet of ABC Co. Ltd., calculate Current ratio and Quick ratio. Balance Sheet of ABC Co. Ltd. as on 31.12.20XX [5+10]

Liabilities	Rs.	Assets	Rs.
Equity share capital	1,500	Plant and machinery	975
Debentures	400	Stock	550
Creditors	200	Debtors	550
Outstanding expenses	100	Cash in hand	375
Profit and Loss Account	100	Prepaid expenses	50
Bank loan (Long-term)	200		
	2,500		2,500

R09

Code No: 55009

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

IC APPLICATIONS

(Common to ECE, EEE, ETM)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Discuss the IC packages in detail.
b) Explain AC and DC applications of op-amp. [7+8]
- 2.a) Explain the operation of a Schmitt trigger circuit.
b) Explain the working of an instrumentation amplifier with a circuit. [7+8]
- 3.a) Design a second order active Butterworth LPF operating at a cutoff frequency of 2KHz.
b) Discuss triangular wave generator from square wave generator. [8+7]
- 4.a) Design an astable multivibrator operating at a frequency of 4KHz and duty cycle is 60%.
b) Explain the operation of PLL. [8+7]
- 5.a) Explain the working of a Weighted resistor D/A converter.
b) Explain successive approximation A/D converter with an example. [7+8]
- 6.a) Prove that two open collector TTL inverters when connected together produce NOR function.
b) Explain NAND gate using CMOS transistors. [8+7]
- 7.a) Implement a full adder with two 4x1 multiplexers.
b) What is priority encoder? How is it different from encoder? Draw the circuit of 4 bit priority encoder and explain. [7+8]
- 8.a) Construct and explain a synchronous MOD-5 counter and explain with waveforms.
b) Show the operation of universal shift register with neat block diagram. [8+7]

---ooOoo---

R09

Code No: R9402

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year I Semester Examinations, November/December – 2016
PHARMACEUTICAL MICROBIOLOGY

Time: 3 hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) Write a note on scope of Microbiology.
- b) Describe the contribution of Pasteur and Lister. [5+10]
2. Enumerate the classification of Fungi with their properties. [15]
3. Discuss in detail about various Nutrient media used for microbial growth with suitable example in each category. [15]
4. Discuss briefly on the various Physical and Chemical agents used in Sterilization and Disinfection. [15]
5. Explain various Hazards and Biosafety measures used in pharmaceuticals. [15]
6. Describe various steps involved in bacterial genetic exchange. [15]
7. Write about the procedure of quantitative evaluation of microbial contamination. [15]
8. Explain principle and methods involved in assay of Vitamins. [15]

--ooOoo--

01

Code No: 115AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

ELECTRICAL MACHINES – III
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Describe a salient pole synchronous machine. [2]
- b) What are the differences between concentrated and distributed windings? [3]
- c) What is meant by voltage regulation of synchronous generator? [2]
- d) Write short notes on slip test. [3]
- e) What is meant by parallel operation? [2]
- f) Discuss about synchronizing power. [3]
- g) What is an excitation circle? [2]
- h) What are the applications of synchronous condenser? [3]
- i) What is a capacitor start and run? [2]
- j) What are the applications of shaded pole motor? [3]

PART - B**(50 Marks)**

- 2.a) Explain in detail about the constructional features of round rotor synchronous machines.
- b) A 150 kVA, 500V, 3 phase star connected alternator has the following test results:
OCC: Line to line voltage is 500V
Field current is 4A
Air-gap line: Line to line voltage is 400V
Field current is 3A
SCC: Field current is 3A
Armature current is 173.21 A
The armature resistance is negligible. Find unsaturated reactance in ohms and per unit. [5+5]

OR

- 3.a) Explain how the harmonics in the generated EMF can be suppressed in synchronous machines.
- b) A three phase star connected alternator has an open circuit voltage of 6000V. The armature resistance and synchronous resistance are 0.4Ω and 4Ω per phase respectively. Find the terminal voltage and the phase difference between terminal voltage and open circuit EMF at a power factor of 0.9 leading. Given load current is 140A. [5+5]

- 4.a) Explain in detail about finding the regulation of synchronous generators using ASA method.
- b) Find the voltage regulation at full load, 0.9 power factor lagging for a three phase, 1000 kVA, 5000 V, star connected alternator having an armature resistance of 0.08Ω per phase and a synchronous reactance of 7Ω per phase. [5+5]

OR

- 5.a) Explain in detail about two reaction analysis.
- b) The OCC of a 6-pole, 440V, 50Hz, three phase star connected alternator is as below

Field current (A)	2	4	6	7	8	10	12	14
Open circuit Voltage (V)	155	280	390	440	475	525	565	590

A field current of 7A is needed to circulate the full load rated current of 35A under short circuit conditions. The field current for rated terminal voltage under full load zero power conditions is 15A. The armature resistance is 0.3Ω per phase. Find the regulation at full load current of 35A at 0.9 lagging power factor using MMF method. [5+5]

- 6.a) Discuss in detail about sub-transient, transient and steady state reactances.
- b) Two similar 3000 kVA alternators operate in parallel. The governor of the first machine is such that frequency drops from 50 Hz at no load to 48 Hz on full load. The corresponding drop for the second machine is 50 Hz to 48.5 Hz. (i) how will they share a load of 4000 kW? (ii) How much maximum unity power factor load can they carry without any one of them getting overloaded? [5+5]

OR

- 7.a) Explain in detail about Synchronizing alternators with infinite bus bars.
- b) A 3 MVA, 6 kV, 1500 rpm, three phase 50 Hz alternator is operating on infinite bus bar. Find synchronizing power per mechanical degree of angular displacement at no load. Also find synchronizing torque for a 0.5° mechanical displacement. Given the synchronous reactance is 30%. [5+5]
- 8.a) Draw the phasor diagram of synchronous motor and explain.
- b) A 2kV, three phase star connected synchronous motor has a synchronous reactance of 9Ω per phase. When the motor delivers 120 kW, the efficiency is 95% (exclusive of field loss). The power angle is 15° . Calculate (i) E per phase (ii) Power factor. Neglect resistance. [5+5]

OR

- 9.a) Explain in detail about hunting and its suppression.
- b) A 3 kV delta connected synchronous motor has synchronous reactance of 15Ω per phase. It operates at a leading power factor of 0.8 when drawing 700 kW from mains. Find excitation EMF? [5+5]
- 10.a) Explain the principle of operation of single phase induction motor.
- b) Explain the operating principle of universal motor. [5+5]

OR

- 11.a) Discuss in detail about the working principle of split phase motors.
- b) Explain in detail about double revolving field theory. [5+5]

Code No: 115DY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

DYNAMICS OF MACHINERY

(Common to AME, ME, MCT, MSNT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Illustrate your answers with NEAT sketches wherever necessary.

PART - A

(25 Marks)

1. a) What is the difference between applied and constrained forces? Explain. [2]
- b) With reference to Naval Ships, explain the terms: *Bow, Stern* (or) *Aft, Starboard, Port, Steering, Pitching, and Rolling*. [3]
- c) Define the following terms: Friction, Limiting force of friction, co-efficient of friction and angle of friction. [2]
- d) Though cone clutches provide high frictional torque, yet they have become obsolete – Why? [3]
- e) What is the difference between centrifugal governors and inertia governors? [2]
- f) In a diesel generating set, is it possible to use only a flywheel or a governor? Give your answer with justification. [3]
- g) Explain the term 'partial balancing of primary force'. [2]
- h) What do you understand by inside cylinder locomotives and outside cylinder locomotives? [3]
- i) What is a *torsionally equivalent shaft*? [2]
- j) Define the terms: Damping factor, Coefficient of damping, and Critical damping Coefficient. [3]

PART - B

(50 Marks)

2. A motor cycle along with the rider weighs 2 KN, the C.G. of the machine and rider combined being 60 cm above the ground, with the machine in vertical position. The M.I. of each road wheel is 1030 N/mm^2 , and the rolling diameter is 60 cm. The engine rotates at 6 times of the road wheels and in the same sense. The M.I. of rotating parts of the engine is 165 N/mm^2 . Determine the angle of heel necessary if the unit is speeding at 62.5 km/h round a curve of 30.4 m. [10]

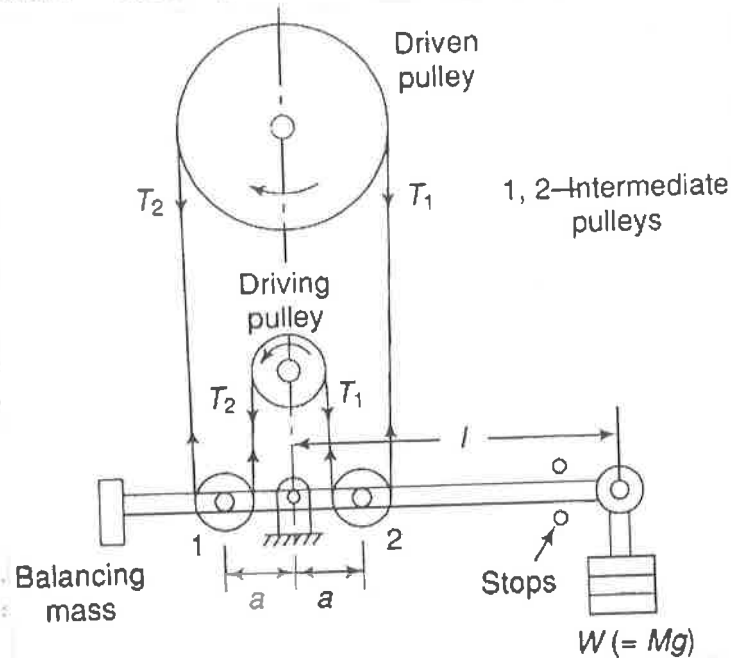
OR

3. The connecting rod of a gas engine weighs 700 N, and has a radius of gyration of 400 mm about an axis through the C.G. The length of the rod between centers is 1 m and the C.G. is 350 mm from the crank pin center. If the crank is 250 mm long, and revolves at a uniform speed of 300 rpm, find the magnitude and direction of the inertia force on the rod, and of the corresponding torque on the crankshaft when the inclination of the crank to the IDC is 135° . [10]

4. With a neat sketch, describe the principle and working of an internal expanding shoe brake. Derive the expression for the force exerted by the cam (a) on the leading shoe, (b) on the trailing shoe. [5+5]

OR

5. In a belt transmission dynamometer shown in the Figure, the diameters of the driving and driven pulleys are 0.36 m and 0.80 m respectively. The power transmitted from the driving to the driven shaft is 20 kW. The speed of the driving shaft is 500 rpm. If $l = 1.2$ m and $a = 400$ mm, determine the weight on the lever. [10]



6. In a turning moment diagram, the areas above and below the mean torque line taken in order are 4400, 1150, 1300, and 4550 mm² respectively. The scales of the turning moment diagram are : Turning moment : 1 mm = 100 N - m ; Crank angle : 1 mm = 1°. Find the mass of the flywheel required to keep the speed between 297 and 303 rpm, if the radius of the gyration is 0.525 m. [10]

OR

7. Prove that for a Hartnell governor:

a) The total lift, $h = \frac{b}{a}(r_2 - r_1)$ and

b) Stiffness of spring, $s = \frac{a}{b} \left[\frac{S_2 - S_1}{r_2 - r_1} \right]$

where a and b = Lengths of bell - crank lever of ball - arm and sleeve - arm respectively ; and S_2 and S_1 = Spring forces at maximum and minimum radii r_2 and r_1 respectively. [5+5]

8. If the balancing mass cannot be introduced in the same plane of rotation as that of the disturbing mass, then two balancing masses must be used. In such situation, explain the cases of (a) the planes of the balancing masses on the same side of the disturbing mass, and (b) the planes of the balancing masses on different sides of the disturbing mass. [5+5]

OR

9. A two-cylinder engine with cranks at 180° and the cylinders on the same side of the crankshaft center-line is having identical reciprocating masses, crank lengths and connecting rod lengths for each cylinder. If the crank of the first cylinder makes an angle of 30° with I.D.C., then to what extent the engine is balanced for:
a) Primary and secondary forces, and
b) Primary and secondary couples. [5+5]

10. Find the frequency of transverse vibrations of a shaft which is simply supported at the ends and is of 40 mm in diameter. The length of the shaft is 5 m. The shaft carries three point loads of masses 15 kg, 35 kg and 22.5 kg at 1 m, 2 m and 3.4 m respectively from the left support. The Young's modulus for the material of the shaft is 200 GN/m^2 . The weight of the shaft is 18.394 N per meter length. [10]

OR

- 11.a) In a spring-mass vibrating system, the natural frequency of vibration is 3.56 Hz. When the amount of suspended mass is increased by 5 kg, the natural frequency is reduced to 2.9 Hz. Determine the original unknown mass and the spring constant.
b) Explain how do you find the natural frequency of oscillation of a compound pendulum. [5+5]

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Code No: 115DT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

COMPUTER NETWORKS

(Common to CSE, IT)

Max. Marks: 75

Time: 3 hours

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is Frame Relay? [2]
- b) Write about communication satellites. [3]
- c) Define time domain reflectometry. [2]
- d) Difference between Pure ALOHA and slotted ALOHA. [2]
- e) Write about Jitter control. [3]
- f) Write down the design issue of network layers. [2]
- g) Write about Tunneling. [3]
- h) What are the concepts of extension header in IPv6? [2]
- i) Compare RPC and RTP. [3]
- j) How does persistence timer is useful in TCP? [3]

PART - B

(50 Marks)

2. Explain and demonstrate Selective repeat sliding window Protocol with an example. [10]

OR

- 3.a) Write short notes on Wireless Transmission. [3+7]
- b) Describe in detail about Lightwave transmission.

4. What is the purpose of CSMA CD? And Explain it. [10]

OR

5. Explain about the following: [5+5]
- a) Spanning Tree Bridge
- b) Remote bridge.

6. Write briefly about Congestion control in datagram subnets. [10]

OR

7. Write an example, demonstrate how to make routing table using distance vector routing. And list down the limitation. [10]

8. How would you describe the operation of Address resolution protocol? [10]

OR

9. Explain in detail about crash recovery. [10]

10. How would you summarize the concepts of E-mail, its architecture and services? [10]

OR

11. Describe in detail about TCP segment header and connection Establishment. [10]

Code No: 115DQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

ANTENNAS AND WAVE PROPAGATION

(Common to ECE, ETM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- | | | |
|------|--|-----|
| 1.a) | What is meant by Beam Area? | [2] |
| b) | What is meant by Polarization? | [3] |
| c) | Why folded dipole antenna is used in yagi antenna? | [2] |
| d) | What is axial mode of radiation? | [3] |
| e) | What is Lunenburg lens? | [2] |
| f) | What are the various feeds used in reflectors? | [3] |
| g) | Define isotopic source. | [2] |
| h) | What is reciprocity of an antenna? | [3] |
| i) | What are the types of Ground wave? | [2] |
| j) | What are the factors that affect the propagation of radio waves? | [3] |

PART - B**(50 Marks)**

2. Find the radiation resistance of elementary dipole with linear current distribution. [10]
OR
3. Derive the expression for far field components of a small loop antenna. [10]
4. What is Yagi-uda Antenna? Explain the construction and operation of Yagi-uda Antenna. Also explain its general characteristics. [10]
OR
5. Explain the Half-Wavelength Folded Dipole. [10]
6. Describe the parabolic reflector used at micro frequencies. [10]
OR
7. Explain the different types of lens antennas. [10]
8. State reciprocity theorem for antennas. Prove that the self-impedance of an Antenna in transmitting and receiving antenna are same. [10]
OR
9. What is linear array? Compare Broad side array and End fire array. [10]
10. Deduce an expression for the critical frequency of an ionized region in terms of its Maximum ionization density. [10]
OR
11. Describe the troposphere and explain how ducts can be used for Microwave propagation. [10]

---ooOoo---

R13

Code No: 115EP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****CONCRETE TECHNOLOGY**

(Common to CE, CEE)

Time: 3 hours**Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Give the chemical composition of cement. [2]
- b) What is fineness modulus of aggregates? What does it indicate? [3]
- c) Define initial setting time and final setting time of cement. [2]
- d) What is the purpose of mixing water in concrete? [3]
- e) Define water cement ratio. [2]
- f) State necessity of curing for cement concrete. [3]
- g) Give any two requirements of concrete mix design. [2]
- h) Differentiate preliminary mixes and trial mixes. [3]
- i) Give two applications of light weight concrete. [2]
- j) Give the advantages of fiber reinforced concrete. [3]

PART - B**(50 Marks)**

2. Explain different methods of measurement of moisture content of aggregates. [10]
- OR**
- 3.a) What is heat of hydration? How does this affect the quality of concrete?
 - b) Explain different laboratory tests to be conducted on cement to decide its quality. [5+5]
- 4.a) What are the various tests to measure workability? Explain any one with neat sketch.
 - b) Explain segregation and bleeding in concrete. [5+5]
- OR**
- 5.a) List out the factors affecting workability and explain them.
 - b) Write short notes on Quality of mixing water. [5+5]
6. List out the non-destructive tests and explain any two non-destructive testing methods on hardened concrete. [10]
- OR**
- 7.a) Define creep and explain the relation between creep and time.
 - b) Explain shrinkage and types of shrinkage. [5+5]

8.a) Explain Maturity of concrete. [5+5]

b) Write short notes on Gel/ space ratio.

OR

9.a) Write step wise procedure for mix design of concrete as per Indian Standards. [5+5]

b) Define durability and its significance.

10.a) Explain light weight aggregate concrete. [5+5]

b) Write short notes on self compacting concrete.

OR

11.a) Explain various types of polymer concretes. [5+5]

b) Write short notes on no-fines concrete.

---ooOoo---

R09

Code No: 55023

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2016
ELECTRONICS MEASUREMENTS AND INSTRUMENTATION
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) With neat diagrams explain the operation of ohm meter. [7+8]
b) Classify and explain different types of errors that occur in measurements. [7+8]
- 2.a) Explain with a diagram how a PMMC can be used as an ammeter. State the precautions to be observed when using an ammeter. [7+8]
b) Explain with the help of block diagram the operation of function generator. [7+8]
- 3.a) Explain Heterodyning. State the working principle of a heterodyne wave analyzer. With a diagram, explain the operation of a heterodyne wave analyzer. [7+8]
b) With neat sketches, explain power analyzer. [7+8]
- 4.a) With neat diagrams explain kelvins bridge.
b) Explain Weins bridge with a diagram. State and derive two balance conditions for a Wein bridge. [7+8]
- 5.a) Write the applications and specifications of CRO. [7+8]
b) Compare Active probes with passive probes. [7+8]
- 6.a) Compare Dual trace and Dual beam oscilloscopes.
b) With neat diagram explain Sampling oscilloscope. [7+8]
- 7.a) Define Strain guage and guage factor. Describe the operation and construction of strain guage. State its limitations. List different types of strain gauges. Explain in detail. [8+7]
b) Explain the working principle of Thermocouple with neat sketches. [8+7]
- 8.a) What is a Data acquisition systems. State the important factors that decide the configuration and subsystem of DAS. [8+7]
b) State the objectives of a DAS. Explain with a block diagram a generalized DAS. [8+7]

---ooOoo---

Code No: 55078

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

MECHANICS OF FLUIDS AND HYDRAULIC MACHINES

(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

- 1.a) What is capillarity? Derive an expression for rise of capillary rise.
 b) A piston of 2.5 kg having diameter and height 4 cm and 7 cm, respectively, is decelerating at the rate of 1 m/s^2 in a hollow lubricated cylinder. The clearance between piston and hollow cylinder is 1.5mm. Calculate the viscosity of the film when the velocity of piston is 8 m/s. [7+8]
- 2.a) Discuss the limitations of Bernoulli's theorem. What are the practical applications of Bernoulli's theorem?
 b) A horizontal pipeline of 80 mm is having a venturimeter with throat 30 mm carrying oil of specific gravity 0.9. Difference of pressure head between enlarged head and throat is 160mm of mercury. Find the discharge through pipe assuming coefficient of discharge of meter as 0.95. [7+8]
- 3.a) What is orifice-meter? Derive an expression for the discharge through orifice meter.
 b) Determine the loss of head due to contraction and coefficient of contraction for the given data. Water flows from a pipe of 200 mm diameter to 100 mm diameter at the rate of $0.005 \text{ m}^3/\text{s}$. Pipes are connected by means of flange-coupling in a manner that their axes coincide. A water - mercury manometer between the two pipes reads the differential pressure reading as 74mm. [7+8]
- 4.a) Show that the efficiency of a free jet striking normally as series of flat plates mounted on the periphery of a wheel never exceeds 50%.
 b) A 75 mm. diameter jet having a velocity of 30 m/sec strikes a flat plate, the normal of which is inclined at 45° to the axis of the jet. Find the normal pressure on the plate when the plate is stationary and when the plate is moving with a velocity of 15 m/sec in the direction of the jet and away from the jet. [7+8]
- 5.a) Draw the layout of a hydro power plant and explain the elements of it.
 b) Explain the pumped storage plants with neat sketches. [7+8]
- 6.a) Describe the principle and working of Kaplan turbine with a neat sketch.
 b) Design a Pelton wheel which is required to develop 1500 KW when working under a head of 160 m at a speed of 420 rpm. The overall efficiency may be taken as 85% and assume other data required. [7+8]
- 7.a) Explain how the performance of a turbine is evaluated with the help of characteristic curves.
 b) Describe the theory and functions of draft tube. [8+7]
- 8.a) Differentiate between reciprocating pump and centrifugal pump.
 b) A centrifugal pump is running at 1000 rpm. The outlet vane angle of the impeller is 30° and velocity of flow at outlet is 3 m/s. The pump is working against a total head of 30 m and the discharge through the pump is $0.3 \text{ m}^3/\text{s}$. If the manometric efficiency of the pump is 75 %, determine: (i) the diameter of the impeller, and (ii) the width of the impeller at outlet. [7+8]

R09

Code No: 55029

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

SOFTWARE ENGINEERING

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Explain the following:
i) Software applications ii) Evolving role of software
b) Distinguish between PSP and TSP. [8+7]
- 2.a) Describe incremental process models with neat diagrams
b) Discuss about non-functional requirements. [8+7]
- 3.a) Explain about requirements management planning.
b) Draw state machine model of the control software for the software for DVD player. [8+7]
- 4.a) What are the elements of interface design, component-level design and deployment-level design.
b) What is architecture? Explain transaction mapping. [8+7]
- 5.a) Describe conduction of component-level design.
b) Explain about task analysis and modeling. [8+7]
- 6.a) Distinguish between black-box and white-box testing techniques.
b) What are class-oriented metrics? Explain. [8+7]
- 7.a) Explain about metrics for software quality.
b) Discuss about RMMM and RMMM plan. [8+7]
8. Explain the following:
a) Simple-driven reviews
b) Quality concepts
c) SQA activities. [5+5+5]

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Code No: 55002

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****DESIGN OF REINFORCED CONCRETE STRUCTURES****(Civil Engineering)**

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

Note: Use of IS 456-2000 is permitted

- 1.a) Define the following terms:
i) Limit state
ii) Characteristic load
iii) Characteristic strength
iv) Partial safety factor
- b) Give the stress block parameters used in limit state method along with the stress diagram. [8+7]
- 2.a) What is T beam? What do you understand by the term economical depth of T beam?
- b) A T beam of effective flange width 1200 mm, thickness of slab 100 mm, width of rib 300 mm and effective depth of 560 mm is reinforced with 4 number 25 mm dia bars. Calculate the factored moment of resistance. Use M20 and Fe415 steel. [5+10]
- 3.a) What is the necessity of providing shear reinforcement?
- b) A simply supported RCC beam 250mm × 450mm deep (effective) is reinforced with a 4-16mm dia bars. Design the shear reinforcement if M20 grade concrete and Fe 415 steel is used and beam is subjected to a shear force of 150kN at service state. [5+10]
4. Design a reinforced concrete slab for a room of clear dimension 4 m × 5 m. the slab is supported on walls of width 300 mm. the slab is carrying a live load of 4 kN/m² and floor finish 1 kN/m². Use M 20 concrete and Fe415 steel. The corners of slabs are held down. [15]
5. Design a square footing of uniform thickness for an axially loaded column of 300 mm × 300 mm column size. Safe bearing capacity of the soil is 180kN/m². Load on column is 900kN. Use M20 concrete and Fe 415 steel. [15]
- 6.a) Write IS specifications for minimum eccentricity and transverse reinforcement of an axially loaded short column.
- b) Design a circular column of diameter 300mm subjected to a load of 1200kN. The column is having spiral ties. The column is 3m long and is effectively held in position at both ends but not restrained against rotation. Use M25 concrete and Fe415 steel. [5+10]

7. A doubly reinforcement rectangular beam of size 250 mm wide and 350 mm effective depth is reinforced with 2 number 20 mm diameter bars at top and 3 number 20 mm diameter bars at bottom being tension reinforcement. If the span of the beam is 6 m and simply supported, check for deflection of the beam. Use M20 concrete and Fe415 steel. [15]

8. Design a dog legged staircase for an office building in a room measuring 3 m × 6 m (clear dimension). Floor to floor height is 3.5 m. The building is a public building liable to overcrowding. Stair is supported on brick wall 230 mm thick at the end of landing. Use M20 and Fe 415 steel. [15]

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R09

Code No: R9401

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy III Year I Semester Examinations, November/December-2016

PHARMACEUTICAL BIOCHEMISTRY

Time: 3hours

Max.Marks:75

**Answer any five questions
All questions carry equal marks**

- 1.a) Write a note on biochemical organization of the cell and molecular constituents of membrane. [8+7]
b) What is sodium and potassium pump and write their significance. [8+7]
- 2.a) How do you determine the change in free energy from equilibrium constant? [8+7]
b) What is reduction potential? Explain it. [8+7]
- 3.a) Define biological oxidation. Explain the components, reactions and inhibitors of ETC. [8+7]
b) What are uncouplers and explain their significance in oxidative phosphorylation. [8+7]
- 4.a) Define Enzyme and coenzyme. Explain the factors affecting enzymatic action. [8+7]
b) Write a note on enzyme repression with reference to drug action. [8+7]
- 5.a) Describe Gluconeogenesis pathway. [8+7]
b) Explain the role of vitamins and inhibitors of TCA cycle. [8+7]
- 6.a) Define and explain the mechanism of deamination and trans-amination of amino acids and give their significance. [8+7]
b) Give the metabolism of any one sulfur containing amino acids. [8+7]
- 7.a) Write the biosynthesis and degradation of cholesterol. [7+8]
b) Define Ketogenesis. Explain metabolism, regulation and its significance in human body. [7+8]
- 8.a) What is xenobiotic metabolism and explain detoxification mechanism. [8+7]
b) What are nucleic acids? Explain purine metabolism. [8+7]

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Code No: 215AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Pharmacy III Year I Semester Examinations, November/December-2016****PHARMACEUTICAL MICROBIOLOGY****Time: 3hours****Max.Marks:75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART – A**(25 Marks)**

- 1.a) What is the scope of microbiology? [2]
- b) What are Prokaryotes? Give examples. [3]
- c) Differentiate aerobes and anaerobes. [2]
- d) What are the nutritional requirements for bacteria? [3]
- e) What is disinfection? [2]
- f) What are the different sterility tests? [3]
- g) What is Mutagenesis? [2]
- h) What is DNA replication? [3]
- i) Mention few microbial contaminants in milk. [2]
- j) What are Bio-sensors? [3]

PART –B**(50 Marks)**

- 2.a) Discuss the discovery of spontaneous generation theory. [4+3+3]
 - b) Describe the classification of virus.
 - c) List out the contribution of Lister.
- OR**
- 3.a) Discuss the contributions of Louis Pasteur to microbiology. [4+3+3]
 - b) Write the economic importance of Fungi.
 - c) Differentiate Prokaryotes and Eukaryotes.
- 4.a) Describe the methods employed for the cultivation of aerobes. [5+5]
 - b) Write about isolation methods of bacteria.
- OR**
- 5.a) Describe various different types of staining of Bacteria. [4+3+3]
 - b) Discuss the components of structure of Fungi.
 - c) What are the major types of sexual spores in Fungi?
- 6.a) Write about Chick-martin test. [3+3+3]
 - b) Classify disinfectants and write their mechanism of action.
 - c) Explain various factors affecting sterilization.
- OR**
- 7.a) Describe the evaluation of disinfectants. [3+3+4]
 - b) Enumerate the limitations of physical agents in sterilization.
 - c) Write the gaseous sterilization methods in labs using Ethylene Oxide.

- 8.a) Write notes on Lac operon.
b) Write a note on chemical mutagens.
c) What is Drug resistance? Give example. [4+3+3]

OR

- 9.a) What is cracking of Gene Code?
b) Write a note on DNA translation.
c) What is Genetic recombination? [4+3+3]

- 10.a) How do you perform sterilization for culture media?
b) What is Pasteurization?
c) Write the microbiological assay of antibiotics. [4+3+3]

OR

- 11.a) Write the microbiological contaminants in air.
b) How do you quantify microbial contamination?
c) Write the importance of microbial limit tests. [4+3+3]

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Code No: 115AK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****ANALOG COMMUNICATIONS****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define noise. [2]
- b) What are the similarities and differences between narrowband FM and AM systems? [3]
- c) What is threshold effect in envelope detector? [2]
- d) Distinguish between simple AGC and delayed AGC. [3]
- e) Define the terms frequency deviation and modulation index for FM wave. [2]
- f) Explain the need for modulation. [3]
- g) Give the classification of radio transmitters. [2]
- h) Explain the need of amplitude limiter in FM receiver. [3]
- i) Calculate the percentage saving in power if only one side band transmission is used over the DSB-SC system at (i) 100% modulation (ii) 50% modulation. [2]
- j) State the sampling theorem. [3]

PART - B**(50 Marks)**

- 2.a) Define modulation and explain the need of modulation.
 - b) A carrier with amplitude modulated to a depth of 50% by a sinusoidal, produces side band frequencies of 5.005 MHz and 4.995MHz. The amplitude of each side frequency is 40V. Find the frequency and amplitude of the carrier signal. [5+5]
- OR**
- 3.a) Draw the block diagram and explain generation of DSB-SC signal using balanced modulator.
 - b) A modulating signal is a multi-tone signal given by
 $m(t) = A_1 \cos w_1 t + A_2 \cos w_2 t + A_3 \cos w_3 t$.
The signal $m(t)$ modulates a carrier $A_c \cos w_c t$. Plot the signal sided spectrum and find the bandwidth of the modulating signal. Assume that $w_3 > w_2 > w_1$ and $A_3 > A_2 > A_1$. [5+5]
- 4.a) What is SSB Modulation and what are its advantages? Draw the block diagram for SSB generation using Phase discrimination method and explain its operation.
 - b) Explain how the base band signal can be recovered from the VSB Signal plus carrier using envelope detector. [5+5]

OR

5.a) Mention applications of different AM Systems.

b) A vestigial filter has a transfer function $H(f)$ with $f_c = 10^5$ Hz. Find the VSB modulated signal when $e_m(t) = \cos(2\pi f_m t)$ and $e_c(t) = 2\cos(2\pi f_c t)$. Assume $f_m = 10^3$ Hz. [5+5]

6.a) Discuss the effect of modulation index on the band width of FM. Explain the generation of WBFM from NBFM with neat sketch.

b) A carrier is frequency modulated by a sinusoidal modulating of frequency 2 kHz, resulting in a frequency deviation of 5 kHz. What is the bandwidth occupied by the modulated waveform? The amplitude of the modulating sinusoid is increased by a factor 2 and its frequency lowered by 500 Hz. What is the new bandwidth? [5+5]

OR

7.a) Compare the direct and indirect methods of generating FM signals. Explain Armstrong method of generating FM signals with a neat block schematic diagram.

b) Draw the spectral representation of FM wave and derive the expression the Transmission bandwidth. [5+5]

8.a) Draw the AM receiver model and determine the signal to noise ratio of AM system.

b) What is the noise equivalent band width? Discuss the trade of between bandwidth and S/N ratio. [5+5]

OR

9. Explain the following:

a) Resistive noise source.

b) Shot noise.

c) In phase and quadrature phase components and its properties.

d) Noise Figure. [10]

10.a) Explain the operation of Superhetrodyne receiver with a neat schematic diagram.

b) Explain the terms:

i) Automatic Gain Control (AGC).

ii) Amplitude limiting

iii) Squelch circuit. [5+5]

OR

11.a) Compare the pulse modulation systems and continuous modulation systems.

b) What is Multiplexing? What are the advantages of Multiplexing? Explain how do you generate Time Division Multiplexing (TDM) signals. [5+5]

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R13

Code No: 115EM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****SOFTWARE ENGINEERING****(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What is legacy software? Explain. [2]
- b) What are the advantages of unified process? [3]
- c) Write the purpose of context model. [2]
- d) What is the significance of feasibility study? [3]
- e) What is the use of interface analysis? Explain. [2]
- f) What do you mean by software design quality? Explain. [3]
- g) Differentiate between verification and validation. [2]
- h) What is regression testing? Give example. [3]
- i) Define software reliability. [2]
- j) What is the importance of software reviews? [3]

PART - B**(50 Marks)**

- 2.a) Discuss about the changing nature of software. [5+5]
 - b) Explain spiral model with its merits and demerits. [5+5]
- OR**
- 3.a) Discuss in brief about different software myths and their consequences. [5+5]
 - b) Explain CMMI model with a neat sketch. [5+5]
- 4.a) Differentiate between functional and non-functional requirements. [5+5]
 - b) List and explain the object models in brief. [5+5]
- OR**
- 5.a) What are the activities of requirements elicitation and analysis? Explain. [5+5]
 - b) Discuss about different structured methods used in software development. [5+5]
- 6.a) Explain the process of mapping dataflow into software architecture. [5+5]
 - b) List the golden rules of user interface design. [5+5]
- OR**
- 7.a) Discuss about pattern based software design in detail. [5+5]
 - b) Define and explain about different types of cohesion. [5+5]

- 8.a) Describe the framework for software product metrics. [5+5]
b) Differentiate between Black box and White box testing.

OR

- 9.a) What are the metrics used for software maintenance? Discuss. [5+5]
b) Briefly discuss about Integration testing strategies.

- 10.a) Differentiate between Reactive Vs Proactive risk strategies. [5+5]
b) What is the significance formal technical review? Explain.

OR

- 11.a) Write a detailed note on ISO 9000 quality standards. [5+5]
b) What types of risks occur during software development? Discuss.

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Code No: 115CH
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech III Year I Semester Examinations, November/December - 2016
VEHICLE DYNAMICS
(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What are the sources of vibration of a vehicle? [2]
- b) Define transmissibility. Give the expression to find the force transmitted to the ground? [3]
- c) What is the mathematical formulae for driveline efficiency. [2]
- d) What are the Factors effecting the gear box design. [3]
- e) What is meant by Active Suspension? [2]
- f) Sketch the Quarter car active suspension model of a passenger car. [3]
- g) Explain the use of LQR in Vehicle Dynamics. [2]
- h) Define Tire Deflection Transfer Function. [3]
- i) List out the advantages of numerical method over matrix method. [2]
- j) Explain Goughs tire characteristics. [3]

PART - B

(50 Marks)

- 2.a) Enumerate the types of tires.
 - b) Differentiate between Bias Ply and Radial ply tires. [5+5]
- OR**
- 3.a) What is purpose of belted radial ply tires?
 - b) Define Cornering Stiffness and derive the expression. [5+5]
- 4.a) Derive an expression for the braking efficiency and breaking distance.
 - b) What are the forces applied on the parked car on a banked road with an expression. [5+5]
- OR**
- 5.a) Why the vibration measurement is necessary in dynamic systems?
 - b) Derive an expression for the driveline and efficiency using required sketch. [5+5]

- 6.a) Explain about H infinite control method.
b) Explain about merits and demerits of H infinite control method. [5+5]

OR

- 7.a) What is meant by LQ problem?
b) Enumerate the merits and demerits of Air suspension system. [5+5]

- 8.a) Enumerate the aerodynamic forces and moments acting on the vehicle.
b) A vehicle of total weight 50 KN is held at rest on a slope of 10° . It has a wheel base of 2.25 m and its CG is 1.0 m in front of the rear axle and 1.5 m above the ground level. Find the normal reaction at the wheel. $W = 50$ KN, $\theta = 10^\circ$, $b = 2.25$ m, $l = 1$ m, $h = 1.5$ m, $R_r = \frac{W}{b} ((b-l)\cos\theta - (h \sin\theta))$, $R_f = \frac{W}{b} (l \cos\theta + (h \sin\theta))$.
c) What are the factors that influence rolling resistance? [3+4+3]

OR

- 9.a) Explain the load distribution of a four wheeler on a level road.
b) Define Grade Resistance, draw bar pull and gradeability.
c) Sketch the schematic diagram of Vehicle longitudinal dynamics. [3+4+3]

- 10.a) Explain the mechanical vibrations using the lagrange method.
b) What is the principle of orthogonality and explain the natural frequencies using sweeping matrix. [5+5]

OR

- 11.a) What are the mechanical vibration elements?
b) Explain the time response of vibrating system briefly. [5+5]

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Code No: 115AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech III Year I Semester Examinations, November/December - 2016****WATER RESOURCES ENGINEERING-I**

(Common to CE, CEE)

Time: 3 hours**Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What are the factors affecting infiltration? [2]
- b) What are the factors affecting run-off? [3]
- c) What do you mean by a unit hydrograph? [2]
- d) What do you understand by infiltration index? [3]
- e) What are the different types of wells? [2]
- f) What is meant by specific capacity of a well? [3]
- g) What do you understand by crop rotation? [2]
- h) Define consumptive use? [3]
- i) What do you understand by balancing depth? [2]
- j) What are the drawbacks in the Kennedy's silt theory? [3]

PART - B**(50 Marks)**

2. What is Hydrologic cycle? Describe with equation that is used to quantify water going through various individual paths of the cycle. Give a neat diagram too. [10]

OR

- 3.a) If you are performing a rainfall analysis, how would you determine if a rain gauge had a consistent recording history? How will you correct the data if the data is inconsistent? [5+5]
- b) Discuss the various factors affecting evapotranspiration. [5+5]
4. Explain the method by which maximum runoff can be estimated from a catchment. Describe the method of computing the ordinates of a unit-hydrograph from the data of a flood hydrograph. [10]

OR

5. Explain briefly what a unit hydrograph and a distribution graph is? Starting from 12 noon, storm rainfalls of 2.5, 7.5 and 5.0 cm occur during three successive hours over a 25 square kilometer area. The storm loss rate (Φ index) is 1.25 cm per hour. The percentages of distribution graph for successive hours are 5,20,40,10 and 5. Estimate the value of peak discharge in cubic m³/sec and the hour when it is expected. [10]

6. Derive an expression for the steady state discharge of well fully penetrating into a confined aquifer. [10]

OR

7. In a certain alluvial basin of 110 km^2 , 100 Mm^3 of ground water was pumped in a year and the ground water table dropped by 4 m during the year. Assuming no replenishment, estimate the specific yield of the aquifer. If the specific retention is 12%, what is the porosity of the soil? [10]

8. Define duty, delta and base period. Derive the relationship between them. Also suggest the steps to be taken to improve the duty. State any two practical applications of duty of water. [10]

OR

9. The discharge available from a tube well is $120 \text{ m}^3/\text{hour}$. Assume 3200 hours of working for a tube-well in a year; estimate the culturable area that this tube-well can command. The intensity of irrigation is 50% and the average depth of Rabi and Kharif crops is 48cm. [10]

10.a) Explain, in brief measurement and estimation of stream flow.

b) What are the various considerations that are made for the alignment of an irrigation canal? [5+5]

OR

11. Using Lacey's theory, design an irrigation channel for the following data:

Discharge $Q = 48 \text{ cumecs}$

Silt factor $f = 1$

Side slopes $= 1/2:1$. [10]

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Code.No: 215AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year I Semester Examinations, November/December-2016
PHARMACOGNOSY – II

Time: 3hours

Max.Marks:75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) What are secondary plant metabolites Give suitable examples. [2]
- b) Explain the production of amino acids via shikimic acid pathway. [3]
- c) Define and classify volatile oils with suitable examples. [2]
- d) Give the source, chemical constituents, morphology and uses of Cassia. [3]
- e) Explain the principle involved in the Gambier Fluorescein test. [2]
- f) Give the source of Balsam of Tolu and discuss its collection and preparation. [3]
- g) What is an Arishta? What is the source of alcohol in Arishta. [2]
- h) How do you prepare Bhasmas? [3]
- i) What are the advantages and disadvantages of Stevioside as a sweetner? [2]
- j) Write the biological sources, Family and Uses of Cotton, Silk and Wool. [3]

PART-B**(50 Marks)**

- 2.a) Discuss primary and secondary plant metabolism.
 - b) Explain the biogenesis of Isoprenoid compounds in detail. [6+4]
- OR**
- 3.a) Explain biogenesis of Atropine.
 - b) Discuss the biogenic pathway for Cardiac glycoside. [5+5]
- 4.a) Give the systematic pharmacognostic study of Ginger.
 - b) Give the botanical source, chemical constituents, method of preparation, substitutes, adulterants and uses of Sandal wood. [5+5]
- OR**
- 5.a) Enlist general methods of isolation of Volatile oils.
 - b) Give the substitutes and adulterants of oils of Dill, Mentha, Eucalyptus, Gaultheria, Citronella and Lemongrass oil.
 - c) Elaborate on systematic pharmacognostic study of Cardamom. [2+3+5]
- 6.a) Define Tannins and classify them with suitable examples.
 - b) Biological source, collection and preparation, chemical constituents, tests for identification and uses of Benzoin. [2+8]
- OR**
- 7.a) Write a short note on plant resins.
 - b) Write biological source, collection and preparation, chemical constituents, tests for identification and uses of Arjuna. [2+8]

- 8.a) Give an account of Ayurveda and basis of Ayurveda system of medicine. [5+5]
b) Describe the methods of preparation of Churnas with a suitable example.

OR

- 9.a) What are Lehyas give its preparation. [4+6]
b) Explain the preparation of Asava and Gutika.

- 10.a) Compare and contrast between natural and synthetic colours.
b) Write a note on Natural sweeteners with special reference to their advantages and disadvantages. [2+4+4]
c) Describe Cotton as surgical fiber.

OR

- 11.a) What is bentonite? Discuss its method of preparation and uses.
b) Write a short note on Saffron as a natural colorant. [4+2+4]
c) Give the source, preparation, chemical constituent and uses of Glass wool.

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R13

Code No: 115AH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****IC APPLICATIONS****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Explain "Latch up" and the circumstances it needed. [2]
- b) Discuss how a logic buffer amplifier is different from an audio amplifier. [3]
- c) List the features of 741 OP-AMP. [2]
- d) List the non-ideal DC characteristics of an OP-AMP. [3]
- e) What is frequency stability? Explain its significance. [2]
- f) What is an Active filter? What are the advantages offered by it over a passive filter? [3]
- g) What are the modes of operation of a Timer? [2]
- h) What is the major difference between digital and analog PLLs? And list the applications of PLL. [3]
- i) How many resistors are required in a 12-bit weighted resistor DAC? Why? [2]
- j) Explain how Dual-slope ADC provides noise rejection? [3]

PART - B**(50 Marks)**

- 2.a) Compare the TTL and CMOS logic families.
 - b) Design a TTL 2-state NAND gate and explain its operation. [4+6]
- OR**
- 3.a) What is interfacing? Explain the operation of TTL driving CMOS.
 - b) Explain the operation of the TTL open collector outputs. [5+5]
- 4.a) What is instrumentation amplifier? What are the features of it? Explain any three applications of instrumentation amplifier.
 - b) Derive input resistance for inverting amplifier with feedback arrangement. [4+6]
- OR**
- 5.a) Discuss how a voltage follower is built using an op-amp.
 - b) In an AC inverting amplifier circuit $R_{in}=50\Omega$, $C_i=0.1\mu F$, $R_1=100K\Omega$, $R_f=1K\Omega$, $R_2=10K\Omega$ and $V_{cc}=\pm 15V$. Determine the Bandwidth of the amplifier. [4+6]

- 6.a) Derive the expression for the transfer function of first order high pass filter. [6+4]
b) Draw the schematic diagram of Wein bridge oscillator and explain its working. [6+4]

OR

- 7.a) Design a first order active high pass filter with cutoff frequency of 2KHz with op-amp. Why this is called Active filter?

- b) Design a Triangular wave generator with $f_0 = 1.5$ KHz and V_0 (PP) = 5V. [5+5]

- 8.a) Describe the 555 timer monostable multivibrator applications in pulse stretching.

- b) Design a 555 timer circuit whose output frequency is 2KHz when the trigger input signal frequency is 4KHz. [5+5]

OR

- 9.a) Explain the operation of frequency multiplier using PLL.

- b) Define Lock-in range, Capture range and Pull-in time in PLL system. [6+4]

- 10.a) Compare the dual slope ADC with successive approximation ADC.

- b) Explain the operation of R-2R ladder DAC with the help of neat diagrams. [4+6]

OR

- 11.a) Explain the operation of flash ADC using relevant diagrams.

- b) What are the merits and demerits of counter type ADC? Explain. [6+4]

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Code No: 55017

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****DYNAMICS OF MACHINERY****(Common to AME, ME, MCT)**

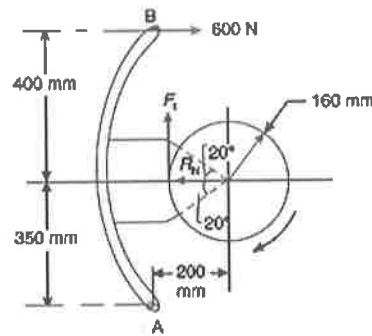
Time: 3 hours

Max. Marks: 75

Answer any five questions**All questions carry equal marks**

1. A rear engine automobile is travelling along a track of 100 metres mean radius. Each of the four road wheels has a moment of inertia of 2.5 kg-m^2 and an effective diameter of 0.6 m. The rotating parts of the engine have a moment of inertia of 1.2 kg-m^2 . The engine axis is parallel to the rear axle and the crankshaft rotates in the same sense as the road wheels. The ratio of engine speed to back axle speed is 3:1. The automobile has a mass of 1600 kg and has its centre of gravity 0.5 m above road level. The width of the track of the vehicle is 1.5 m. Determine the limiting speed of the vehicle around the curve for all four wheels to maintain contact with the road surface. Assume that the road surface is not cambered and centre of gravity of the automobile lies centrally with respect to the four wheels. [15]
2. The crank length and connecting rod length of a petrol engine, running at 1800 r.p.m. are 50 mm and 200 mm respectively. The diameter of the piston is 80 mm and the mass of the reciprocating parts is 1 kg. At a point during the power stroke, the pressure on the piston is 0.7 N/mm^2 , when it has moved 10 mm from the inner dead centre. Determine:
a) Net load on the gudgeon pin
b) Thrust in the connecting rod
c) Reaction between the piston and cylinder
d) The engine speed at which the above values become zero. [15]
3. A four bar mechanism is to be designed, by using three precision points, to generate the function
 $y = x^{1.5}$, for the range $1 \leq x \leq 4$.
Assuming 30° starting position and 120° finishing position for the input link and 90° starting position and 180° finishing position for the output link, find the values of x , y , θ and ϕ corresponding to the three precision points. [15]
- 4.a) A conical friction clutch is used to transmit 90 kW at 1500 r.p.m. The semicone angle is 20° and the coefficient of friction is 0.2. If the mean diameter of the bearing surface is 375 mm and the intensity of normal pressure is not to exceed 0.25 N/mm^2 , find the dimensions of the conical bearing surface and the axial load required.

- b) The below Figure shows a brake shoe applied to a drum by a lever AB which is pivoted at a fixed point A and rigidly fixed to the shoe. The radius of the drum is 160 mm. The coefficient of friction at the brake lining is 0.3. If the drum rotates clockwise, find the braking torque due to the horizontal force of 600 N at B. [5+10]



5. A single cylinder double acting steam engine delivers 185 kW at 100 r.p.m. The maximum fluctuation of energy per revolution is 15 percent of the energy developed per revolution. The speed variation is limited to 1 percent either way from the mean. The mean diameter of the rim is 2.4 m. Find the mass and cross-sectional dimensions of the flywheel rim when width of rim is twice the thickness. The density of flywheel material is 7200 kg/m^3 . [15]
6. In an engine governor of the Porter type, the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40° , find, taking friction into account, range of speed of the governor. [15]
7. A four cylinder inline marine oil engine has cranks at angular displacement of 90° . The outer cranks are 3 m apart and inner cranks are 1.2 m apart. The inner cranks are placed symmetrically between the outer cranks. The length of each crank is 450 mm. If the engine runs at 90 r.p.m. and the mass of reciprocating parts for each cylinder is 900 kg, find the firing order of the cylinders for the best primary balancing force of reciprocating masses. Determine the maximum unbalanced primary couple for the best arrangement. [15]
8. An electric motor is to drive a centrifuge, running at four times the motor speed through a spur gear and pinion. The steel shaft from the motor to the gear wheel is 54 mm diameter and L metre long, the shaft from the pinion to the centrifuge is 45 mm diameter and 400 mm long. The masses and radii of gyration of motor and centrifuge are respectively 37.5 kg, 100 mm, 30 kg and 140 mm. Neglecting the inertia effect of the gears, find the value of L if the gears are to be at the node for torsional oscillation of the system and hence determine the frequency of torsional oscillation. Assume modulus of rigidity for material of shaft as 84 GN/m^2 . [15]

Code No: 55012

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

CONTROL SYSTEMS

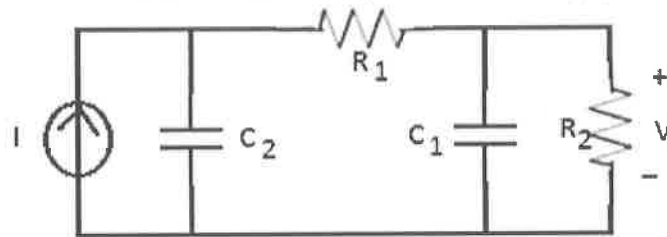
(Common to ECE, EEE, ETM)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Draw the block diagrams of open and closed loop control systems and explain the differences.
b) What are the basic parts in a translational system? How they are modeled mathematically? [8+7]
- 2.a) What is a AC servo motor? Derive its transfer function.
b) Draw the block diagram for the circuit below and obtain the transfer function between 'I' and 'V' using block diagram algebra. [8+7]



- 3.a) Explain different time domain specifications and their significance.
b) Determine the step, ramp and parabolic error constants of the following unity feedback control system whose open loop transfer function is given by [8+7]

$$G(s) = \frac{10}{1+s^2}$$

- 4.a) Explain the significance of location of poles in complex plane with examples.
b) Find the angles of asymptotes and the intersect of the asymptotes of the root locus of the following equation when K varies from $-\infty$ to ∞ [8+7]
- $$9s^3 + 3s^2 + 2s + K(s+3) = 0$$

- 5.a) What are the frequency domain specifications? Explain their role in control systems.
b) The forward path transfer function of a unity feedback system is given by

$$G(s) = \frac{K}{(s+5)^2}$$

Using Bode diagram, determine the value of K so that the gain margin of the system is 30 dB. [8+7]

- 6.a) What is Nyquist stability criterion? Explain.
b) The loop transfer function of a system is given by

$$G(s)H(s) = \frac{15}{s^2(s+5)}$$

Draw the polar plot.

[8+7]

- 7.a) Draw the electrical circuit diagram of a Lead compensator and explain its operation.
b) With the help of its Bode diagram, explain the location of poles in a lead lag compensator. [8+7]

- 8.a) What is a state transition matrix? Explain its properties.
b) Determine the state and output equations in vector matrix form for the system whose transfer function is given by [6+9]

$$G(s) = \frac{(s+1)}{s(s^2+7s+12)}$$

---ooOoo---

R09

Code No: R9405

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year I Semester Examinations, November/December-2016
PHARMACOLOGY - I

Time: 3 hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) Explain in detail various types of drug action.
b) Write a brief note on Pharmacogenetics.
c) Write a note on tolerance and dependence. [6+4+5]
- 2.a) Write a note on Absorption, distribution metabolism and excretion of drugs.
b) Write a note on synergistic effects of drugs. [10+5]
3. Describe the Pharmacology of sympathomimetics and sympatholytics. [15]
- 4.a) Write about the classification and mechanism of action of Local anesthetic agents.
b) Write the classification of drugs used in the treatment of Parkinsonism.
c) Write the mechanism of action and uses of Opioid analgesics. [7+4+4]
5. Write the classification of antipsychotic drugs. Explain in detail the pharmacology of Haloperidol. [15]
- 6.a) Explain the pharmacology of sedatives and hypnotics.
b) Write a note on centrally acting muscle relaxants. [10+5]
- 7.a) Write about the mechanism of action, uses and side effects of Phenobarbitone.
b) Classify drugs used in treatment of depression.
c) Write a note on hallucinogens. [5+5+5]
8. Describe the mechanism of action, adverse effects and uses of:
a) Paracetamol
b) Celecoxib
c) Diazepam [5+5+5]

--ooOoo--

R13

Code No: 115AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define accuracy and precision. [2]
- b) What is loading effect in voltmeter? [3]
- c) Compare Moving coil with Moving iron instruments. [2]
- d) Draw the internal structure of CRT and list its functions. [3]
- e) Draw the block diagram of spectrum analyzer. [2]
- f) What are the advantages of digital instruments over analog instruments? [3]
- g) Draw the block diagram of Digital Data Acquisition System. [2]
- h) Name the different temperature sensors and their advantages. [3]
- i) State the LVDT principle. [2]
- j) Explain the procedure of air-flow measurement. [3]

PART - B**(50 Marks)**

- 2.a) Explain about source for different types of errors and precautions to minimize them.
- b) The accuracy of five digital voltmeters are checked by using each of them to measure a standard 1.0000V from a calibration instrument. The voltmeter readings are as follows: $V_1=1.001v$, $V_2=1.002v$, $V_3=0.999v$, $V_4=0.998v$ and $V_5=1.0000v$. Calculate the average measured voltage and the average deviation. [5+5]

OR

- 3.a) With a neat diagram, explain the working of a True RMS responding volt meter.
- b) A PMMC instrument has FSD of $100 \mu A$ and a coil resistance of $1K\Omega$. Calculate the required shunt resistance value to convert the instrument into an ammeter with (i) FSD=100mA and (ii) FSD=1A. [5+5]

- 4.a) What is the principle of harmonic distortion analyzer? Explain its operation with the help of a functional block diagram.
- b) Compare the selectivity characteristics of the Spectrum Analyzer and Heterodyne Wave Analyzer. [5+5]

OR

- 5.a) With a neat sketch explain the operation of a heterodyne type wave analyzer.
- b) Explain the following terms associated with Spectrum Analyzer:
 - i) Sensitivity
 - ii) Dynamic Range
 - iii) Harmonic Mixing
 [5+5]

- 6.a) Explain how Lissajous figures are used to determine the characteristics of unknown input. Show how to estimate input if the pattern is (i) Circle (ii) Ellipse (iii) Parabola.
b) Derive an expression for electrostatic deflection sensitivity of a CRO. [5+5]

OR

- 7.a) Draw the block diagram of storage oscilloscope and explain the function of each block.
b) Derive the expression for vertical deflection of electron beam in CRT. [5+5]
- 8.a) Explain how LVDT is used to measure linear displacement.
b) Show that a parallel plate capacitor serves as the most suitable transducer for measurement of linear and angular displacements. [5+5]

OR

- 9.a) Show that a parallel plate capacitor serves as the most suitable transducer for measurement of linear and angular displacements.
b) A transducer that measures force has nominal resting resistance of 300Ω and is excited by $7.5V$. When a 980 dyne force is applied, all four equal resistance bridge elements change resistance by 5.2Ω . Find the output voltage E_o . [5+5]

- 10.a) The basic AC bridge consists of the following constants:
AB: $R=400 \Omega$, BC: $R=150 \Omega$, CD: unknown and DA: $R=100 \Omega$ in series with $L=10mH$. Oscillator frequency is $1KHz$. Determine the constants of arm CD.
b) What is Wien's bridge? Derive the expression for the frequency. [5+5]

OR

- 11.a) Explain different methods of liquid level measurements.
b) Explain different steps adopted by a controller in data acquisition in asynchronous Mode. When asynchronous method of data acquisition is required. [5+5]

---ooOoo---

Code No: 115AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****POWER SYSTEMS-II****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) List different types of conductors. [2]
- b) What is transposition of transmission lines? [3]
- c) Define the voltage regulation in transmission lines. [2]
- d) Classify the transmission lines based on the voltage. [3]
- e) State proximity effect. [2]
- f) What is the effect of resistance of solid conductors? [3]
- g) Classify the types of insulators. [2]
- h) List the methods for improving string efficiency. [3]
- i) How are HV cables classified? [2]
- j) Give the expression for calculating insulation resistance. [3]

PART - B**(50 Marks)**

- 2.a) A single phase, two wire transmission line 20km long, is made up of round conductors each 0.9cm in diameter, separated from each other by 45cm. Calculate the equivalent diameter of a fictitious hollow, thin-walled conductor having the same inductance as the original line. What is the value of this inductance?
 - b) What are bundled conductors? Discuss the advantages of bundled conductors, when used for overhead lines. [5+5]
- OR**
- 3.a) Briefly discuss the various types of conductor material used for over head transmission lines.
 - b) Discuss the concept of geometric mean distance. How is this concept used to find the inductance of composite conductor line? [5+5]
4. Derive the expressions for regulation and efficiency of a short transmission line. Draw required circuit and phasor diagram. [10]
- OR**
5. What is an equivalent π circuit model of long line? Derive expression for parameters of this circuit in terms of line parameters. [10]

- 6.a) Explain surge impedance loading.
b) Determine the auxiliary constants of a 3-phase, 50Hz, 200km long transmission line having resistance, inductance and capacitance per phase per km of 0.15 ohm, 3.5mH and $0.009\mu\text{F}$ respectively. [4+6]

OR

- 7.a) What is a travelling wave? Explain the development of such a wave on an overhead line.
b) An overhead transmission line with surge impedance 400 ohms is 300 km long. One end of this line is short circuited and at the other end a source of 11 kV is suddenly switched in. Calculate the current at the source end 0.005 sec after the voltage is applied. [5+5]
- 8.a) What are disadvantages of providing too much or too small sag in a transmission line? Name different types of line supports with their place of use.
b) A transmission line conductor with diameter 14.5 mm, cross-sectional area of 125 mm^2 weighing 1118 kg/km has a span of 200 meters. The supporting structures being level. The conductor has an ultimate tensile stress of 42 kg/mm^2 and allowable tension is not to exceed $\frac{1}{4}$ th of ultimate strength. Determine the following
i) Sag in still air.
ii) Sag with a wind pressure of 60 kg/m^2 and an ice coating of 10 mm.
Also calculate the vertical sag under this condition. Assume density of ice as 0.915 gm/c.c. [4+6]

OR

- 9.a) Explain the factors affecting the mechanical design.
b) Determine the maximum sag of an overhead line conductor having a diameter of 19mm weighs 0.85 kg/m. The span length is 250 meters; wind pressure is 40 kg/m^2 of projected area with ice coating of 13 mm. The ultimate strength of the conductor is 8000 kg, the factor of safety is 2 and ice weighs 910 kg/m^3 . [4+6]
-
- 10.a) Describe briefly some commonly used insulating materials for cables.
b) A 12.5 kV single-core cable has an outside diameter of 8 cm. Determine the radius of the core and the electric field strength that must be withstand by the insulating material in the most economical (optimal-ratio) configuration. [4+6]

OR

- 11.a) Discuss the methods of grading cables. Why are they not used generally?
b) A single core 2 km long cable has a conductor radius of 1.3cm and an insulation thickness of 3.5 mm. If the resistivity of dielectric is $7 \times 10^{12}\text{ ohm-m}$, determine the insulation resistance of the cable. [5+5]

---ooOoo---

R13

Code No: 115AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****REINFORCED CONCRETE STRUCTURES DESIGN AND DRAWING**

(Common to CE, CEE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What are the assumptions made in the working stress method of design? [2]
- b) Explain the salient features of under-reinforced, balanced and over-reinforced sections. [3]
- c) What are the different methods of strengthening the RC section to resist shear force? [2]
- d) Explain the factors influencing the crack-width in flexural member. [3]
- e) Distinguish between the behavior of one-way and two-way slabs. [2]
- f) Explain the necessity of corner reinforcement in two-way slabs. [3]
- g) Explain the functions of transverse reinforcement in a RC column. [2]
- h) Define slenderness ratio of a column and what are its implications? [3]
- i) What is the purpose of providing a footing for any structure? [2]
- j) Explain the load transfer mechanism in a two-column combined footing. [3]

PART - B

(50 Marks)

2. Design a doubly reinforced concrete simply supported rectangular beam of span 6 m and cross-section 300 mm × 600 mm (Over all depth). The beam is to carry a factored imposed load of 120 kN/m. Use M25 grade of concrete and Fe415 steel. [10]
- OR**
3. Determine the moment of resistance of a T-beam section with an effective flange width of 1100 mm, width of rib 230 mm and overall depth of the T-beam is 550 mm. The thickness of the slab is 125 mm. The beam is reinforced with 4 bars of 25 mm diameter on tension side. Use M20 grade of concrete and Fe415 steel. [10]
4. Design the reinforcement of a beam section 300 mm × 600 mm subjected to an ultimate twisting moment of 120 kNm and an ultimate shear force of 80 kN. Use M 20 concrete and Fe 415 steel. Sketch the reinforcement details. [10]
- OR**
5. A simply supported RC beam of effective span 5 m has cross-section 230 mm × 450 mm (overall depth) is reinforced with 3 bars of 20 mm diameter on tension and 2 bars of 12 mm diameter on compression side. The beam is subjected to an imposed working load of 15 kN/m. Determine the short term deflection and long term deflection. Adopt M 20 grade concrete and Fe 415 steel. [10]

6. Design a simply supported RCC slab for a room of clear dimensions 4.2 m × 6.0 m subjected to live load of 3 kN/m² and floor finish of 1 kN/m². Assume the width of supports is 300 mm. Use M 20 concrete and Fe 415 steel. Draw the reinforcement detailing. [10]

OR

7. Design a continuous reinforced concrete roof slab for a room of 5 m × 14 m. The thickness of the roof is 125 mm and supported by RCC beams of 230 mm wide spaced at 3.5 m c/c. The slab is to carry an imposed load of 3 kN/m² and floor finish of 1 kN/m². Use M 20 concrete and Fe 415 steel. Also draw the reinforcement detailing. [10]

8. Design an RC column of height 3.6 m and cross-section 400 mm × 400 mm located at the corner of a multi-storied building to support an axial load of 2250 kN together with moments 60 kNm and 45 kNm acting in two perpendicular planes. Use M 25 concrete and Fe 415 steel. [10]

OR

9. Design the reinforcement for a rectangular column 450 mm × 500 mm and effective length 6.6 m, using the following data:
Factored axial load: 1500 kN;
Factored moment about major axis is 60 kNm at top and 45 kNm at bottom
Factored moment about minor axis is 45 kNm at top and 30 kNm at bottom
The column is restrained against sway. Use M 25 concrete and Fe 415 steel. [10]

10. Design an RC square footing for a column of size 400 mm × 400 mm subjected to an axial factored load of 1800 kN. The safe bearing capacity of soil is 200 kN/m². Use M 25 concrete and Fe 415 steel. [10]

OR

11. A staircase room has clear dimensions 4 m × 2.5 m and the height between the floors is 3.3 m. Design a suitable dog-legged stair case with mid-landing. Use M 20 grade concrete and Fe 415 steel. Draw the reinforcement detailing in one of the flights. [10]

---ooOoo---

Code No: 115EG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS****(Common to AME, EIE, IT, ME, MCT, MIE, MSNT)****Time: 3 hours****Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Describe any two exceptions of the law of demand? [2]
 b) Distinguish between 'Law of demand and Elasticity of demand'. [3]
 c) What is the managerial significance of expansion path? [2]
 d) What results in External Economies of Scale? [3]
 e) Mention any two features of monopolistic competition. [2]
 f) What are the advantages of sole proprietorship form of organization? [3]
 g) What are the various sources for mobilizing long term capital by an organization? [2]
 h) What factors influence the volume of working capital? [3]
 i) What are activity ratios? Give two examples: [2]
 j) What do you understand by 'double-entry' book keeping? [3]

PART - B**(50 Marks)**

- 2.a) What is elasticity of demand? What are the various types of elasticity? [5+5]
 b) Describe the qualitative methods of demand forecasting. [5+5]
- OR**
- 3.a) What do you understand by managerial economics? What is the scope of it? [5+5]
 b) What are the different factors involved in demand forecasting? [5+5]
- 4.a) How are isoquant curves classified?
 b) A company makes a product with a selling price of \$25 per unit and variable costs of \$15 per unit. The fixed costs for the period are \$45,000. What is the required output level to make a target profit of \$12,000? [4+6]
- OR**
- 5.a) What are the differences between break even analysis and CVP analysis?
 b) The Sherston Brick Company manufactures a standard stone block for the building industry. The production capacity for the year is 120,000 standard blocks. The selling price per block is \$1.80, variable costs are \$0.60 per brick and fixed costs are \$60,000 per annum. Determine the break-even point in terms of sales revenue and production output. [5+5]

- 6.a) What is a joint stock company? What are the advantages and disadvantages of this form?
- b) Explain price – output determination under monopolistic competition, with suitable diagrams and examples. [5+5]

OR

- 7.a) What are the various methods of pricing?
- b) What do you understand by pricing? What are the important objectives of pricing? [5+5]
- 8.a) What is the payback period method of evaluating capital investment proposals? What are the advantages and disadvantages of this method?
- b) What is working capital? What are the various sources of raising working capital? [5+5]

OR

- 9.a) What is accounting rate of return (ARR) method of evaluating capital investment decisions?
- b) Calculate the net present value of a project which requires an initial investment of \$243,000 and it is expected to generate a cash inflow of \$60,000 each month for 12 months. Assume that the salvage value of the project is \$1500. The target rate of return is 12% per annum. [5+5]
- 10.a) With assumed data, illustrate various turnover ratios.
- b) What is the importance of capital structure ratio? [5+5]

OR

- 11.a) Explain the Du-Pont chart/analysis.
- b) What procedure would you adopt while finalizing accounts of a business unit with the help of a valid trial balance? [5+5]

Code No: 115AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****PRINCIPLES OF PROGRAMMING LANGUAGES****(Computer science and Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define syntax and semantics. [2]
- b) List out language categories. [3]
- c) What is the purpose of assignment statement? [2]
- d) What is a variable? What are the attributes of a variable? [3]
- e) Differentiate between function and procedure. [2]
- f) Write an example of call and return statements. [3]
- g) What is the difference between a C++ class and an Ada package? [2]
- h) Define Semaphore and monitor. [3]
- i) Write the advantages of scripting languages. [2]
- j) What are the applications of functional programming languages? [3]

PART - B**(50 Marks)**

- 2.a) How can user-defined operator overloading harm the readability of a program? Explain. [7]
- b) Define grammars, derivation and a parse tree. [3]

OR

- 3.a) Discuss about language recognizers and language generators. [5]
- b) Describe the basic concept of axiomatic semantics. [5]

- 4.a) Explain in detail counter-controlled loops. [5]
- b) What are various design choices for string length? [5]

OR

- 5.a) What are the design issues for names? [3]
- b) Explain associative arrays, their structure and operations. [7]

- 6.a) Explain the scope and lifetime of variables with examples. [5]
- b) What are the characteristics of co-routine feature? List the languages which allow co-routines. [5]

OR

- 7.a) Explain how subprogram names are passed as parameters. Illustrate with examples. [5]
- b) Discuss user defined overloaded operators. [5]

- 8.a) What is meant by logic programming? Explain different types of applications of logic programming. [5+5]
b) Discuss briefly exception handling in ADA.

OR

- 9.a) What is the difference between checked and unchecked exception in java? [4+6]
b) Briefly Explain the Sub-program level concurrency.
10.a) Compare functions in ML and Haskell.
b) Write about the operations that can be performed on atoms and lists in LISP. [4+6]

OR

- 11.a) Make a comparison between functional and imperative Languages. [5+5]
b) Write a short note on data and procedural abstraction.

---ooOoo---

R09

Code No: 55004

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

GEOTECHNICAL ENGINEERING-I

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. A soil sample has a diameter of 38.1 mm and a length of 76.2 mm. Its wet weight is 1.843 N and its dry weight is 1.647 N. The specific gravity of soil solids is 2.7
- a) Determine the dry unit weight, bulk unit weight, void ratio, porosity, water content and degree of saturation.
- b) Suppose the diameter was incorrectly measured to be 37.6 mm and the length incorrectly measured to be 75.6 mm. What would be the resulting error in the computed values of degree of saturation and water content? [8+7]
- 2.a) A loose uncompacted sand fill 2 m in depth has a relative density of 40%. Laboratory tests indicated that the minimum and maximum void ratios of the sand are 0.46 and 0.90 respectively. The specific gravity of solids of the sand is 2.65
- i) What is the dry unit weight of the sand?
- ii) If the sand is compacted to a relative density of 75%, what is the decrease in thickness of the 2 m fill?
- b) Explain various indices and their importance. [8+7]
- 3.a) Explain about Falling head Permeability test.
- b) Explain any one In-situ permeability test with a neat sketch. [7+8]
- 4.a) ~~Discuss about the principle of effective stress and quick sand condition.~~
- b) In a deposit of silty soil, the water table which was at originally at a depth of 1 m below ground level was lowered to 3m below ground level. The bulk and saturated unit weight of silty soil was 18kN/m^3 and 20kN/m^3 respectively. What is the change in effective pressure at a depth of 1.0 m and 3.0 m. [7+8]
- 5.a) An annular ring footing of external and internal radii of 4m and 3m respectively, transmits a pressure of 20kN/m^2 . Calculate the vertical stress at a depth of 1.0m and 2.0m below the centre.
- b) Briefly explain the contact pressure distribution beneath a footing, founded on cohesive and cohesion less soils. [8+7]
- 6.a) Differentiate between compaction and consolidation.
- b) Explain why compaction is not suitable for pure sand?
- c) Discuss about field compaction equipment. [5+5+5]

- 7.a) Discuss briefly about logarithm of time fitting method.
- b) A normally consolidated clay layer 2m thick is sandwiched between two sand layers. The average overburden stress at the middle of clay layer can be taken as 160kN/m^2 . Due to construction of a structure there is an increase in effective vertical stress of 40kN/m^2 at the middle of clay layer. The liquid limit of clay layer is 60% and the initial void ratio is 0.9. Estimate the primary settlement. [7+8]
- 8.a) List a few important problems in soil engineering where knowledge of shear strength is essential.
- b) In a consolidated un-drained test with pore pressure measurements on a normally consolidated clay, a sample consolidated under a stress of 200 kPa failed at an additional axial stress of 150 kPa. The pore pressure at failure was 75 kPa. Determine analytical shear strength parameters in terms of effective stresses. [7+8]

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R09

Code No: 55022

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****ANTENNAS AND WAVE PROPAGATION****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) Define terms Beam Area, Radiation Intensity and distinguish between Directive gain and Power gain.
- b) Calculate the electric field (Erms) due to isotropic radiator radiating 3KW at a distance of 2 Km from it. [8+7]
- 2.a) An antenna has radiation resistance of 73 ohms and a lossy resistance of 7 ohms. If the power gain is 20, calculate the directivity and efficiency of antenna.
- b) Sketch and compare radiation pattern of horizontal half wave dipole and those of vertical half wave dipole. [8+7]
- 3.a) For a 2 element linear antenna array separated by a distance of $d = 3\lambda/4$, derive the field quantities and draw its radiation pattern for the phase difference of 45° .
- b) Define Effective Area and Compare Broadside and End fire array. [10+5]
- 4.a) Draw and explain the function of Helical antenna and various modes of radiation, list its applications.
- b) Explain in detail Design Considerations of Pyramidal Horns. [9+6]
- 5.a) Explain the Cassegrain mechanism in transmission mode. List out the advantages and disadvantages of Cassegrain feed.
- b) With necessary illustrations explain the radiation characteristics of microstrip antenna and list its applications. [8+7]
- 6.a) Describe the non metallic dielectric Lens antennas in detail.
- b) Calculate minimum distance required to measure the field pattern of an antenna of diameter 2m at a frequency of 3GHz. Derive the necessary equations. [8+7]
- 7.a) Define Wave Tilt and explain Field Strength Variation with Distance and Height.
- b) What are the different types of wave propagations and explain M- Curves. [8+7]
- 8.a) Explain the terms (i) Maximum usable frequency (ii) Virtual height (iii) Ray path (iv) Critical frequency.
- b) Discuss the reasons for reduction of field strength in sky wave propagation. [8+7]

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Code No: 55031

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****OPERATING SYSTEMS****(Common to CSE, IT)****Time: 3 Hours****Max. Marks: 75****Answer any Five Questions
All Questions Carry Equal Marks**

- 1.a) What do you mean by distributed system? List various possible types of failure in a distributed system.
b) Describe different general methods for passing parameters to the operating system. [8+7]
- 2.a) Explain the difference between preemptive and nonpreemptive scheduling with an example.
b) Using Amdahl's Law, calculate the speedup gain of an application that has a 70 percent parallel component for
i) Two processing cores
ii) Four processing cores. [8+7]
3. Illustrate how a binary semaphore can be used to implement mutual exclusion among k processes (where k=1,2,...). [15]
- 4.a) Explain the difference between internal and external fragmentation in memory management.
b) In a fixed-partitioning scheme, what are the advantages of using unequal-size partitions? [8+7]
-
- 5.a) What are the different conditions that create deadlock? Explain them.
b) List two ways in which the no-preemption condition can be prevented in deadlock. [8+7]
- 6.a) List and briefly explain different file organizations.
b) Explain various approaches for free space management in memory. [8+7]
- 7.a) Explain the tertiary storage structure with an example.
b) Distinguish between a STREAMS driver and a STREAMS module. [8+7]
- 8.a) State and explain the goals and principles of operating system protection.
b) Discuss the need for implementing security defences for systems. [7+8]

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Code No: 55080

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

VEHICLE DYNAMICS

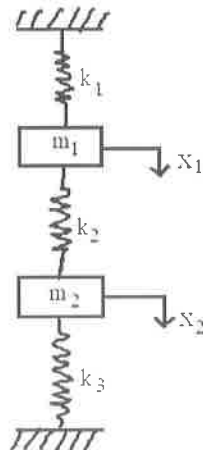
(Automobile Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) What is the importance of natural frequency and explain the parameters controlling it?
- b) Derive differential equation of motion of a horizontal spring mass system by D' Alembert's principles. [7+8]
- 2.a) Explain with graphs the effect of over damping under damping and critical damping on the amplitude of vibration.
- b) A spring mass dashpot system consists of spring of stiffness 343 N/m. The mass is 3.43 kg. The mass is displaced 2 cms beyond the equilibrium position and released. Find the equations of motion for the system if the damping coefficient of the dashpot is equal to 137.2 N-sec-m. [7+8]
- 3.a) Differentiate between steady state vibrations and transient vibrations.
- b) The damped natural frequency of a system as obtained from a free vibration test is 9.8Hz. During forced vibration test with constant exciting force on the same system the maximum amplitude is found be at a frequency of vibration of 9.6 Hz. Find damping factor for the system and natural frequency. [7+8]
- 4.a) What is the need of measuring the velocity and acceleration of the vibrating systems?
- b) An instrument for measuring acceleration records 30 oscillations/sec. The natural frequency of the instrument is 800 cycles/sec. What is the acceleration of the machine part to which the instrument is attached, if the amplitude recorded is 0.02mm? What is the amplitude recorded is 0.02mm? What is the amplitude of vibration of the machine part? [7+8]
5. The details of the spring mass system is given in figure and it $K_1 = K_3 = K$; $K_2 = 2K$ and $m_1 = m_2 = m$. Determine the natural frequencies and normal modes. [15]



Figure

6. The reciprocating motion of the engine develops unbalanced forces and forced vibrations. How they can be isolated so that they will not be transmitted to the vehicle. [15]

7. What are the various types of tyres used on automobiles and explain about Radial and Bias-ply tyres? [15]

8. How the Dunkerley's method is used to find the natural frequency of a system? [15]

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R13

Code No: 215AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year I Semester Examinations, November/December-2016
PHARMACOLOGY – I**Time: 3hours****Max.Marks:75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) Explain Plasma protein binding and its influence in drug action. [2]
- b) Define Pharmacoepidemiology. [3]
- c) Name any four skeletal muscle relaxants. [2]
- d) Write the parasympathetic effect over eye, heart and lung. [3]
- e) Discuss briefly about any two neurotransmitters. [2]
- f) Write a note on Carvedilol. [3]
- g) Explain tolerance and dependence with example. [2]
- h) Write a note on Lidocaine. [3]
- i) Write four examples of SSRIs. [2]
- j) Write in brief about Chlorpromazine. [3]

PART-B**(50 Marks)**

- 2.a) What is Biotransformation? [2+8]
 - b) Explain different phases of Biotransformation with examples. [2+8]
-
- OR**
- 3.a) Define Bioassay. [2]
 - b) List the official drugs assayed using bioassay technique. [5]
 - c) What are Orphan drugs with examples? [3]
- [2+5+3]
- 4.a) Define and classify sympathomimetic drugs with examples. [5]
 - b) Explain in detail about ganglionic stimulants. [5]
- OR**
5. Explain in detail the pharmacology of reversible cholinesterase inhibitors. [10]
- 6.a) Define General Anesthetics with examples. [3]
 - b) Write down the mechanism of action and ideal properties of General anesthetics. [7]
- [3+7]
- OR**
- 7.a) Enumerate the characterization of depressive and anxiety disorders. [3]
 - b) Explain the pharmacology and ADR of Tricyclic antidepressants. [7]
- [3+7]

- 8.a) Define Local anesthetics. [2+8]
b) Discuss the clinical uses of Lidocaine, Bupivacaine and tetracaine. [8]

OR

9. Explain the pharmacology, therapeutic uses and adverse effects of different Salicylates. [10]
10. Explain the pharmacology and therapeutic uses of Lithium for treatment of Mania. [10]

OR

- 11.a) Discuss in detail the pharmacology, adverse effects and therapeutic uses of Barbiturates. [8+2]
b) State few examples of anti epileptic drugs. [2]

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R09

Code No: R9404

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Pharmacy III Year I Semester Examinations, November/December-2016
PHARMACEUTICAL TECHNOLOGY - I

Time: 3hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) Explain the bioavailability studies for prodrugs.
b) What are the objectives of preformulation studies? Explain the preformulation studies for disperse systems. [7+8]
- 2.a) Enumerate the additives used for the formulation of liquid dosage forms.
b) Write about evaluation of dry syrups. [10+5]
- 3.a) Write about industrial production of emulsions.
b) Give the classification of semisolid bases and mention their relative advantages. Briefly write about the methods of evaluation of semisolids. [7+8]
- 4.a) Give the classification of propellants for aerosols with suitable example.
b) Explain the evaluation tests for aerosols. [6+9]
- 5.a) Write the ideal characteristics of ophthalmic preparations.
b) Write about the formulation additives used in the preparation of ophthalmic preparations. [5+10]
- 6.a) Write the differences between brushless shaving cream and lather shaving cream. Explain the preparation of lather shaving cream.
b) Write about the formulation and evaluation of hand creams. [8+7]
- 7.a) Write about the ingredients used in nail polish and its preparation.
b) What are abrasives? Give their classification and mention their qualities. [9+6]
- 8.a) Define displacement value and mention its significance.
b) Write the advantages and disadvantages of suppositories. Explain the preparation and evaluation of suppositories. [4+11]

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Code No: 115AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December – 2016

POWER ELECTRONICS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART – A

(25 Marks)

- 1.a) Define Latching current. [2]
- b) What is the importance of line commutation? [3]
- c) What are the advantages of Free wheeling diode? [2]
- d) What is meant by overlapping period in phase controlled converters? [3]
- e) Write few applications of choppers. [2]
- f) What is meant by Time Ratio Control? [3]
- g) What assumptions are considered for the operation of inverters? [2]
- h) Classify inverters according to connections. [3]
- i) Draw the basic structure of TRIAC and its circuit symbol. [2]
- j) Define AC voltage controller. [3]

PART – B

(50 Marks)

- 2.a) Give the constructional details of SCR with the help of schematic diagram and circuit symbol.
- b) Explain in detail the two transistor analogy of SCR. [5+5]

OR

- 3.a) Describe the different modes of operation of a thyristor with the help of its V-I characteristics.
- b) Two thyristors having a difference of 4mA in latching current are connected in series in the circuit. Voltages across the devices are 450V and 300V. Calculate the required equalizing resistance and capacitance, if the permissible difference in blocking voltage is 10V and the difference in the recovery charge is 5 μ C. [5+5]

- 4.a) Explain the operation of single phase fully controlled converter with RL load. Derive the output voltage and current expressions for firing angle of 45 degrees.
- b) A single phase fully rectifier is used to supply power to load having impedance 200 ohms and 150 mH, from 230V, 50Hz, ac supply at a firing angle of 90 degrees. Calculate
 - i) Average values of output voltage and current
 - ii) RMS values of output voltage and current. [5+5]

OR

5. Explain the operation of three phase Bridge type Full Converter with RL – load with neat waveforms. [10]

- 6.a) What is time ratio control in dc choppers? Explain the use of TRC for controlling the output voltage in choppers.
- b) A step-up chopper has input voltage of 220V and output voltage of 660V. If the conducting time of thyristor-chopper is $100\mu\text{s}$, compute the pulse width of output voltage. In case the output-voltage pulse width is halved for constant frequency operation, find the average value of new output voltage? [5+5]
- OR**
- 7.a) Describe the Morgan chopper with associated voltage and current waveforms.
- b) Enumerate the merits of Morgan chopper compared to Jones chopper. [5+5]
8. Discuss the following:
- a) Single pulse Modulation
- b) SPWM Technique. [5+5]
- OR**
9. Explain in detail about 180° Conduction Mode of 3 - ϕ Voltage Source Inverters. [10]
- 10.a) Explain the various modes of operation of TRIAC with the help of equivalent circuits and relevant waveforms.
- b) A single phase half wave AC voltage controller has a resistive load of $R = 40\ \Omega$ and the input voltage is $V_s = 230\text{V}$, 50Hz. The Delay angle of thyristor is 50 degrees. Determine
- i) The rms value of output voltage V_0 ,
- ii) The input power factor,
- iii) The average input current. [5+5]
- OR**
11. Describe the operating principle of single-phase to single-phase step-up cycloconverter with the help of mid-point and bridge type configuration. Illustrate your answer with appropriate circuit and waveforms. [10]

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Code No: 115EB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

LINEAR AND DIGITAL IC APPLICATIONS

(Common to ECE, ETM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Define unity gain band width of an op-amp. [2]
- b) Define slew rate. What causes it? [3]
- c) What is switched capacitor filter? [2]
- d) Draw the circuit diagram of AM detector using PLL. [3]
- e) Which type of ADC is the fastest? Why? [2]
- f) An 8 bit DAC has a resolution of 20mv/bit. What is analog output voltage? [3]
- g) Mention any two applications of multiplier IC. [2]
- h) Realize EX-OR gate with CMOS circuit. [3]
- i) Write the difference between static and dynamic RAM's. [2]
- j) Draw the block diagram of 3-bit ring counter. [3]

PART - B**(50 Marks)**

2. With neat circuit diagram explain the operation of Schmitt trigger. [10]
- OR**
- 3.a) An IC op-amp 741 used as an inverting amplifier with a gain of 100. The voltage gain vs frequency characteristic is flat up to 12 kHz. Find the maximum peak to peak input signal that can be feed without causing any distortion to the output.
 - b) Draw and explain the output waveform of the ideal inverter circuit when the input is square wave. [5+5]
4. Explain the operation of mono stable multi vibrator using 555 timers. Derive the expression of time delay of mono stable multi vibrator with 555 timers. [10]
- OR**
- 5.a) From the given component values find the free running frequency. Control voltage $V_c=10.9v$, $V_{cc}=12v$, $R_1=4.7k$ and $C_1=1.1Nf$.
 - b) Design a narrow band bandpass filter using op-amp. The resonant frequency is 100HZ and $Q=2$. Assume $c=0.1Uf$. [5+5]
6. Draw the schematic block diagram of dual slop A/D converter and explain its operation. Derive expression for its output voltage. [10]
- OR**
- 7.a) What are the limitations of weighted resistor type D/A converter?
 - b) What do you mean by quantization error in an A/D converter? [5+5]

8. Find the state diagram and state table of a binary coded decimal to excess-3 decoder. [10]

OR

9. Draw the basic DTL gate and explain its operation. [10]

10.a) Design a 4 to 16 decoder using two 74×138 IC's.

b) Implement the following Boolean expression using 74×151 IC $F(z) = AB + BC + AC$. [5+5]

OR

11. With the help of timing diagram explain read and write operations of SRAM. [10]

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Code No: 115DX

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****DISASTER MANAGEMENT****(Common to CE, CEE, CSE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Distinguish disaster and hazard. [2]
- b) Highlight any three types of shelter strategies. [3]
- c) Discuss the use of Geo Informatics in Disasters. [2]
- d) Describe the vulnerability indicators. [3]
- e) Mention the quantification of disaster risk. [2]
- f) Draw a note on disaster leading to food insecurity. [3]
- g) What is risk transfer? [2]
- h) Write the benefits of disaster management centres. [3]
- i) What is debt swap and state its merits. [2]
- j) Explain disaster preparedness. [3]

PART - B**(50 Marks)**

2. Explain the phases of disaster management. Describe natural disaster and list out the natural disaster with the help any one case study. [10]
- OR**
- 3.a) Describe manmade disaster and list out the natural disaster.
 - b) Describe the psychological and social dimensions of disasters. [5+5]
- 4.a) Critically evaluate the role played by NGOs in disaster management plan.
 - b) Explain various types of Disasters and discuss their causes and effects in India. [5+5]
- OR**
- 5.a) Highlight any three types of shelter strategies.
 - b) Define Flood. List out some of the causes and adverse effects of floods. [5+5]
- 6.a) Explain the policy instruments for disaster intervention.
 - b) Brief the meaning of mitigation and rehabilitation. [5+5]
- OR**
7. Analyze the integrating disaster risk in poverty reduction strategy. [10]

8.a) Distinguish between the loss of capital and loss of stocks. [5+5]
b) State the economic consequences of disaster.

OR

9. Elucidate the pattern of financing disaster management in India. [10]

10.a) Discuss the disaster management code. [5+5]
b) Write short notes on disaster management groups.

OR

11. Discuss the various risk management programmes in India. [10]

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Code No: 115ER

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 2016****THERMAL ENGINEERING – II**

(Common to AME, ME)

Time: 3 hours**Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Draw Rankine cycle on p-V and T-S diagrams. [2]
- b) What is meant by Reheating and its advantages? [3]
- c) Write the significance of accessories of a boiler. [2]
- d) Draw different nozzle cross sections and explain them. [3]
- e) Draw velocity triangle at exit for impulse turbine. [2]
- f) Explain the working principle of Ejector condenser. [3]
- g) What is the purpose of regeneration in the gas turbine? [2]
- h) Explain the purpose of compressor in gas turbine plant. [3]
- i) Write equation for Thrust power and propulsive power. [2]
- j) Explain liquid propellant rocket engine. [3]

PART - B**(50 Marks)**

- 2.a) Draw combined cycle diagram and explain briefly.
- b) In a steam turbine installation running on ideal Rankine cycle steam leaves the boiler at 10 MPa and 700°C and leaves turbine at 0.005 MPa. For the 50 MW output of the plant and cooling water entering and leaving condenser at 15°C and respectively determine.
 - i) The mass flow rate of steam in kg/s
 - ii) The mass flow rate of condenser cooling water in kg/s
 - iii) The thermal efficiency of cycle
 - iv) The ration of heat supplied and rejected (in boiler and condenser respectively).Neglet K.E. and P.E. changes. [5+5]

OR

- 3.a) Explain the significance of adiabatic flame temperature.
- b) Draw the line diagram and explain the flue gas analysis using Orsat apparatus. [5+5]
- 4.a) Compare and contrast the boiler mountings and accessories.
- b) Draw the line diagram and explain the working of a Benson boiler and mention its limits. [5+5]

OR

- 5.a) Derive the equation for critical pressure ratio in nozzles.
- b) An impulse turbine of 1MW has steam entering at 20 bar 300°C and steam consumption of 8 kg per kW hour. Steam leaves at 0.2 bar and 10% of total heat drop is lost in overcoming friction in deveining portion of nozzle. If throat diameter of each nozzle is 1 cm then determine (i) the number of nozzle required (ii) exit diameter of each nozzle. Solve using mollier diameter. [5+5]

- 6.a) Draw the line diagram and explain pressure compounded impulse turbine.
- b) A single stage of simple impulse turbine produce 120 kW at blade speed of 150 m/s when steam mass flow rate is 3 kg/s. Steam enters moving blade at 350 m/s and leaves the stage axially. Considering velocity coefficient of 0.9 and smooth entry without shock into blades, determine the nozzle angle and blade angles. Solve using velocity diagram. [5+5]

OR

- 7.a) Draw the line diagram and explain the working of evaporative condenser.
- b) In a reaction turbine 6 kg/s steam is admitted at 15 bar dry saturated in the first stage. Turbine has eight pairs on mean diameter of 50 cm and run at 3000 rpm with mean blade speed to steam velocity ratio of 0.8. There occurs tip leakage of steam at all rows amounting to 10% of total and efficiency of working steam is 85%. Considering blade outlet angles for both fixed and moving blades to be 20°, determine the following analytically.
- The output from turbine in hp
 - The pressure of steam leaving turbine,
 - The mean blade height.
- [5+5]

- 8.a) Briefly derive the equation for Brayton cycle efficiency.
- b) In a Brayton cycle gas turbine power plant the minimum and maximum temperature of the cycle are 300 K and 1200 K. the compression is carried out in two stages of equal pressure ratio with intercooling of the working to the minimum temperature of the cycle after the first stage of compression. The entire expansion is carried out in one stage only. The isentropic efficiency of both compressors is 0.85 and that of the turbine is 0.9. Determine the overall pressure ratio that would give the maximum net work per kg working fluid. Take $\gamma = 1.4$. [5+5]

OR

- 9.a) Draw the line diagram and explain the Reheat gas turbine cycle.
- b) A gas turbine plant has air being supplied at 1 bar, 270 C to compressor for getting compressed up to 5 bar with isentropic efficiency of 85%. Compressed air is heated upto 1000 K in combustion chamber where also occurs a pressure drop of 0.2 bar. Subsequently expansion occurs to 1 bar in turbine. Determine isentropic efficiency of turbine, if thermal efficiency of plant is 20%.
Neglect the air property variation throughout cycle. Take $\gamma = 1.4$ [5+5]

10.a) Explain the working of Turbojet engine with the help of pressure, velocity, temperature variations.

- b) A jet propulsion engine has compressor with pressure ratio 4 and compressed air enters into combustion chamber where combustion occurs so as to yield temperature of 500°C at turbine inlet. Actual temperature at inlet to combustion chamber is 10% more than that of isentropic compressor temperature rise. Exhaust from turbine is expanded up to atmospheric pressure of 1 bar. The ambient temperature is 285 K . Determine (i) power required to drive compressor, (ii) air fuel ratio if calorific value of fuel is 43100 kJ/kg , (iii) static thrust developed per kg of air per second. [5+5]

OR

11.a) Derive the equation for propulsive efficiency of rocket propulsion.

- b) Compare and contrast liquid and solid propellant rocket engines in detail. [5+5]

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R09

Code No: 55003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

ENGINEERING GEOLOGY

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Write the importance of Geology for the Civil engineering designs. [7+8]
b) Discuss the failure of any Civil engineering construction.
- 2.a) What are physical properties of mineral? Discuss them in detail. [8+7]
b) Write the physical properties of calcite and feldspar.
- 3.a) What is igneous rock? Discuss the texture and structure of igneous rocks. [8+7]
b) Write an essay on formation of metamorphic rocks.
- 4.a) What is fold? Discuss various types of fold? [7+8]
b) What are fault terminologies? Explain them in detail.
- 5.a) What is magnetic method? How does it help in exploration? [7+8]
b) Write the electrical resistivity method with neat sketch.
- 6.a) What is dam? Write the various types of dams with neat sketches. [7+8]
b) What are the factors influencing the reservoirs life? Discuss them in detail.
- 7.a) What is ground water exploration? Write the techniques for exploration of ground water with neat sketch. [8+7]
b) What is an earthquake? Write the causes of an earthquake.
- 8.a) What is tunnel? How they are constructed? Discuss the supporting system of tunnel. [8+7]
b) What is subsidence? Write the procedure for predicting the subsidence.

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Code No: 55020

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations; November/December - 2016

APPLIED THERMODYNAMICS-II

(Common to AME, ME)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. The composition by weight of fuel is 65% hexane (C_6H_{14}) having a net calorific value of 43080 kJ/kg and 35% Benzene (C_6H_6) having a net calorific value of 38900 kJ/kg. Determine (a) Air fuel ratio for stoichiometric mixture and the calorific value of 1 m^3 of the mixture at STP treating the fuels as gases; 1 kg-mol of fuel has volume 22.42 m^3 at STP. (b) The CO_2 % by volume in the dry products of combustion from a 30% rich mixture. Assume complete combustion of H_2 . [7+8]
2. During a boiler trial the following observations were made:
 Duration of trial = 1 hour,
 Steam generated = 35500 kg,
 Steam pressure 12 bar,
 Steam temperature = 250°C ,
 Temperature of water entering economizer = 17°C ,
 Temperature of water leaving economizer = 77°C ,
 Oil burnt = 3460 kg,
 Calorific value of the fuel = 39500 kJ/kg.
 Calculate a) equivalent evaporation per kg of fuel b) Thermal efficiency of plant
 c) % heat energy of the fuel energy utilized by the economizer. [5+5+5]
3. A steam turbine develops 185 kW with consumption of 16.5 kg/kWh. Pressure and temperature of the steam at inlet of nozzle are 12 Bar and 220°C respectively. The steam leaves the nozzle at 1.2 Bar. The diameter of nozzle at throat is 7 mm. Find the number of nozzles. [15]
4. A single row impulse turbine develops 132.4 kW at a blade speed of 175 m/s, using 2 kg of steam per sec. Steam leaves the nozzle at 400 m/s. Velocity coefficient of the blades is 0.9. Steam leaves the turbine blades axially. Determine the nozzle angle, Blade angles at entry and exit, assuming no shock. [15]
- 5.a) Show that for maximum diagram efficiency of a reaction turbine blade steam speed ratio is equal to $\cos \alpha$, where α is angle of absolute inlet velocity.
 b) What are the assumptions used in the above problem? And also derive the expression for maximum efficiency. [7+8]
6. The air entering a steam condenser with steam is estimated at 6 kg/hr. The temperature at the inlet to air cooler section is 30°C and at the outlet is 26°C . The vacuum in the shell is essentially constant throughout and is 721 mm of Hg, while the barometer reads 758 mm of Hg. Calculate a) The volume of air entering the cooling section per hour
 b) The mass of moisture contained in the air c) The mass of steam condensed per hr in the cooling section. [5+5+5]

7. A Gas turbine plant works between the temperature limits of 11520 K and 2880 K. Isentropic efficiency for compressor and turbines are 0.85 and 0.8 respectively. Determine the optimum pressure ratio for maximum work output and also for maximum cycle thermal efficiency. [15]

8. Explain various types of rocket propellants. Explain Schematically. [15]

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Code No: 55024

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2016

ANALOG COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) With necessary expressions, waveforms and spectrums, Explain AM for an arbitrary baseband signal $m(t)$.
b) The output power of an AM transmitter is 1KW when sinusoidally modulated to a depth of 100%. Calculate the power in each side band when the modulation depth is reduced to 50%. [10+5]
- 2.a) Draw the circuit diagram for ring modulator and explain its operation indicating all the waveforms and spectrums.
b) In an AM-SC system the modulating signal is a single tone sinusoid $E_m \cos \omega_m t$ which modulates a carrier signal $E_c \cos \omega_c t$. Plot the spectrum of the modulated wave. [8+7]
- 3.a) Explain with block diagram, the phase discrimination method of generating SSB modulated waves.
b) Calculate the percentage power saving when the carrier and one of the sidebands are suppressed in an AM wave modulated to a depth of 100% and 50%. [10+5]
- 4.a) An FM wave with modulation index $\beta = 1$ is transmitted through an ideal band pass filter with mid band frequency f_c and bandwidth is $5f_m$, where f_c is the carrier frequency and f_m is the frequency of the sinusoidal modulating wave. Determine the amplitude spectrum of the filter output.
b) Which method of FM signal generation is the preferred choice, when the stability of the carrier frequency is of major concern? Discuss the method in detail. [8+7]
- 5.a) Explain the operation of the balanced slope detector using a circuit diagram and draw its response characteristics. Discuss in particular the method of combining the outputs of the individual diodes. In what way is this circuit an improvement on the slope detector and in turn what are the advantages.
b) Compute the bandwidth requirement for the transmission of FM signal having a frequency deviation 75 KHz and an audio bandwidth of 10KHz. [10+5]
- 6.a) Derive the expression for figure of merit of AM system for large case.
b) Explain the noise performance of SSB - SC receiver and prove its S/N Ratio is unity. [8+7]

7.a) When a super heterodyne receiver is tuned to 555 KHz, its local oscillator provides the mixer with an input at 1010 KHz what is the image frequency? The antenna at receiver is connected to mixer via a tuned circuit whose loaded Q is 40. What will be rejection ratio for the calculated image frequency?

b) Explain the purpose of pre-emphasis and de-emphasis circuits and the working of these circuits. [6+9]

8.a) Describe the generation and demodulation of PPM with the help of block diagram and hence discuss its spectral characteristics.

b) Explain why a single channel PPM of system requires the transmission of synchronization signal, where as a single channel PAM or PDM system does not it. [8+7]

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Code No: 215AD**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Pharmacy III Year I Semester Examinations, November/December-2016****PHARMACEUTICAL TECHNOLOGY – I****Time: 3hours****Max.Marks:75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A**(25 Marks)**

- 1.a) Write the I.P. specifications for flow properties with respect to angle of repose. [2]
- b) How Arrhenius plot is useful in stability studies in preformulation and formulation? [3]
- c) Ophthalmic preparations need to be isotonic. Why? [2]
- d) Explain the anatomy of skin with respect to penetration of drug. [3]
- e) How a dry syrup is administered to patient? [2]
- f) Mention the types of propellants used in formulation of aerosol. [3]
- g) Enlist the ideal properties of face powders. [2]
- h) Enumerate the beneficial and harmful effect of sunburn products. [3]
- i) Mention about the packaging systems for powder and granules. [2]
- j) What do you mean by tamper-resistant package? Give examples. [3]

PART-B**(50 Marks)**

- 2.a) Define the solubility parameters. How does it help in identifying the solvent composition in monophasic dosage form?
- b) Explain three important parameters for characterization of bulk powders. [4+6]

OR

- 3.a) Define shelf life. Explain the factors affecting the stability. How stability of dosage form can be enhanced?
- b) Explain how prodrug approach is useful in prevention of presystemic metabolism of drugs. [6+4]

4. Explain the different semisolid dosage forms with examples. [10]

OR

- 5.a) Discuss the containers for packaging of ophthalmic preparations.
- b) Explain the package integrity test for eye drops. [6+4]

- 6.a) Explain the components of an aerosol package.
- b) How aerosols are filled? Explain with suitable diagrams. [5+5]

OR

- 7.a) Discuss how dry syrups of antibiotics are prepared?
- b) Mention the evaluation test for dry syrups. [6+4]

8. Describe the fundamentals of cosmetic technology and give the classification of cosmetics. [10]

OR

9.a) Write about different types of Hair dyes.

b) Differentiate between Tooth powder and Tooth paste. [6+4]

10.a) Classify packaging systems with examples. Describe the factors influencing the choice of containers.

b) Write on the containers for ointments. [7+3]

OR

11. Describe in detail about quality control tests for packing materials. [10]

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R09

Code No: R9403

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Pharmacy III Year I Semester Examinations, November/December-2016

PHARMACOGNOSY - II

Time: 3hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) Define glycosides, write about cardiac glycosides and give Pharmacognostic study of Digitalis.
- b) Write microscopic (T.S. and powder) characters and identification tests of Ginseng and Glycyrrhiza. [8+7]
- 2.a) Define alkaloids. Explain the general method of extraction of alkaloids. Write briefly about for Datura chemical tests and uses.
- b) Briefly explain the Pharmacognostic study of Kurchi. [8+7]
3. What are tannins? Classify them with specific examples. Write a brief note on Black catechu and Myrobalan. [15]
4. Give classification of resins; write about Pharmacognostic study of Asafoetida. [15]
5. Write the biological source, preparation and identification tests of papain and diastase. [15]
6. Describe in detail the Basic metabolic pathway leading to Biosynthesis of morphine. [15]
7. Give a Brief account on the important natural dyes used in pharmacy. [15]
8. Write the source, composition and Pharmaceutical uses of Kaolin and Bentonite. [15]

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