

FACULTY OF ENGINEERING**B.E. 3/4 (Civil) I – Semester (Backlog) Examination, November / December 2018****Subject: Fluid Mechanics – II****Time: 3 Hours****Max.Marks: 75****Note:** Answer all questions from Part A and any five questions from Part B.**PART – A (25 Marks)**

- 1 Define critical depth in four different ways [2]
- 2 What do you understand by backwater effect and afflux [2]
- 3 What is the difference between friction drag and pressure drag [2]
- 4 What is Reynolds's model law [2]
- 5 Differentiate between Francis and Kaplan turbine [2]
- 6 Distinguish between gradually varied flow and rapidly varied flow [3]
- 7 Draw Hydraulic Gradient Line for gradually varied flow in open channel [3]
- 8 What are the causes which result in separation of boundary layer [3]
- 9 Distinguish between distorted model and undistorted models [3]
- 10 Define the manometric efficiency of centrifugal pump [3]

PART – B (5x10 = 50 Marks)

- 11 a) Explain in detail with sketches the pressure and velocity distribution in an open channel [5]
 - b) A trapezoidal channel has a side slope of 1 horizontal to 1½ vertical and the longitudinal slope of the bed is 1 in 2000. The area of the cross section is 55 m². If Chezy's constant 'C' is 50. Determine the dimensions of the section discharge for the most efficient section. [5]
- 12 a) Explain briefly various gradually varied flow profiles and their characteristics [5]
 - b) The loss of energy head in a hydraulic jump is 4.85m. The Froude number just before the jump is 8.0. Find the i) discharge per meter width of the channel. ii) the depths before and after the jump [5]
13. a) Define water hammer. Derive an expression for pressure rise due to sudden valve closure. [5]
 - b) Assuming the velocity distribution in the boundary layer as $\frac{u}{U} = \frac{3y}{u} - \left(\frac{y}{u}\right)^2$ determine the thickness of the boundary layer and the shear stress intensity 0.8m from the whole leading edge and the drag force on one side of a plate 1.25m long and 1.2m wide placed in water of velocity 0.3m/sec. Take μ as 0.001Ns/m² for water. [5]
- 14 a) Explain different types of models and their scale ratios. [5]
 - b) The discharge characteristics of a spillway 17.5m long are to be determined. It is designed to discharge 150 cumec at a head of 3.25m. The supply available in the laboratory is 50.5 lt/sec. Calculate i) Prototype – model length ratio ii) Length of model spillway and iii) head over the model spillway [5]

- 15 a) Explain in details the significance of characteristics curves in turbine [5]
b) A pelton wheel is working under a head of 50m and the rate of flow of water through the jet is 900 l/s. Find the efficiency and power produced by the wheel, if the jet is deflected by the bucket through an angle of 160° . Draw the velocity triangles. Take $C_v = 0.98$ [5]
16. a) Derive the dynamic equation of gradually varied flow [5]
b) Explain in details the various applications of impact of jets. [5]
- 17 Write short notes **Two** of the following [10]
a) Positive and negative surges in an open channel
b) Boundary layer separation
c) Specific speed of a turbine.

FACULTY OF ENGINEERING

B.E. 3/4 (EEE) I - Semester (Backlog) Examination, November / December 2018

Subject : Electrical Machinery – II

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions from Part-A & any five questions from Part-B.**PART – A (25 Marks)**

- 1 In an autotransformer, the power transferred from primary to secondary is partly by conduction & partly by induction. Explain.
- 2 Give merits & demerits of star–star connections.
- 3 Explain why Open circuit test is generally conducted on LV side & short circuit test on HV side of transformer.
- 4 What are the conditions for parallel operation of single phase transformers?
- 5 Show that rotor copper loss is slip times the power input to the rotor.
- 6 What are the different losses in an induction motor? How do you find efficiency of such motors?
- 7 List the different methods of speed control of Induction motors.
- 8 Draw the torque–slip curves of an induction motor showing motoring, braking & generating mode.
- 9 List out the advantages of single phasing in three phase transformers.
- 10 Explain the process of crawling & cogging in 3 phase Induction motors.

PART – B (50 Marks)

- 11 A 50Hz Scott connected transformer supplied an unbalanced 2 phase load at 200V per phase. For the leading phase (phase A) the load has a resistance of $10\ \Omega$ & inductance of 42.3H . For the other phase the load consists of $13.3\ \Omega$ & a capacitor of $318\ \mu\text{F}$ in series. Neglecting the magnetizing current & internal Impedance of transformer calculate the line currents on 3 phase side. The main transformer primary to Secondary turns ratio is 12/1.
- 12 (a) List the various methods of testing of transformers & Explain any one test in detail.
(b) Two single phase transformers A & B of equal voltage ratio are running in parallel to supply a load of 1000A at 0.8 p.f lag. The equivalent impedances of transformers are $(2+j3)\ \Omega$ & $(2.5+j5)\ \Omega$. Calculate the current supplied by each transformer & ratio of KW output of the two transformers.

..2..

- 13 A 400V ,50HZ 3 phase star connected 4 pole I.M has stator impedance $Z_1=(0.07+j0.3)$ ohm & rotor impedance referred to stator side $Z_2= (0.08+j0.3)$ ohm .The magnetizing reactance is 10ohms & resistance representing core losses is 50 ohms .Calculate a) stator current & p.f b) torque developed .Use approximate equivalent circuit .Assume slip of 4%
- 14 (a) Two 50Hz 3 phase I.M having 6 poles & 4 poles are cumulatively cascaded ,the 6 pole being connected to.the main supply .Determine the frequencies of rotor currents & slips referred to each stator fields if the Set has a slip of 2%.
(b) Explain the pole changing method of speed control of 3 phase Induction motor
- 15 (a) Is it possible to connect two 1-phase transformers to give a 3-phase output from a 3-phase input? Explain
(b) A 3-phase induction motor is connected to an unbalanced supply voltage. Under the condition, derive its equivalent circuit and show that the net electromagnetic torque is reduced.
- 16 (a) Explain the purpose of use of tertiary windings & how this winding reduces imbalances .
(b) A 500V ,50Hz ,6 pole 3 phase induction motor develops 20 h.p inclusive of mechanical losses when running at 995 rpm .The power factor of the motor is 0.87 lag. Calculate (a) slip (b) rotor copper losses (c) total input if stator losses are 1500W & d) line current.
- 17 (a) Deduce the expressions for the load shared by two transformers in parallel When No Load voltages of these Transformers are not equal .
(b) A Squirrel cage Induction motor has full load slip of 5%. It's standstill impedance is 0.866 /ph .It is started using an auto transformer .If the maximum allowable supply current is 100A. Calculate tap position & ratio of starting torque to full load torque .

FACULTY OF ENGINEERING

B.E. 3/4 (Inst) I – Semester (Backlog) Examination, November / December 2018

Subject: Signal & Systems

Time: 3 hours

Max. Marks: 75

Note: Answer All Questions from Part – A and any five questions from Part – B.**PART – A (25 Marks)**

- 1 Find whether the system is linear or non-linear $y(t) = e^{x(t)}$. 3
- 2 Find out the signal is Periodic or Aperiodic $x(t) = \sin 10ft + \cos 20ft$. 2
- 3 Find exponential Fourier series coefficient of $x(t) = 10 \cos\left(\frac{ft}{2} + \frac{f}{4}\right)$. 3
- 4 Write the necessary condition for orthogonality of two functions. 2
- 5 Prove the Time Scaling property of Fourier Transform. 3
- 6 Write down the condition for existence of Fourier transform. 2
- 7 Find the Laplace Transform of signal $x(t) = e^{j\hat{s}t} .u(t)$. 3
- 8 Explain the relation between Laplace Transform and Fourier Transform. 2
- 9 Find Z-transform of signal $x(n) = 2\left(\frac{1}{5}\right)^n .u(n)$. 3
- 10 Define ROC for Z-transform. 2

PART – B (5x10 = 50 Marks)

- 11 a) Determine whether the following signal is a power or energy signal 5

$$x(n) = e^{j\left[\frac{f}{3}n + \frac{f}{2}\right]}$$
- b) Test the following system for linearity, time invariance, and causality. 5

$$\frac{d^2 y(t)}{dt^2} + 10y(t) \cdot \frac{dy(t)}{dt} + 5t \cdot y(t) = x(t)$$
- 12 Explain the symmetry properties of Trigonometric Fourier series. 10
- 13 a) Determine Fourier Transform of the signal $x(t) = e^{-5|t|} \cdot \text{sgn}(t)$. 5
 b) Find Fourier transform of a Sigmum Function. 5
- 14 a) Find the initial value of the following Laplace transform 5

$$X(s) = \frac{s+4}{s^2+3s+5}$$
- b) Find the inverse Laplace transform of the following Laplace transform. 5

15 a) Find Inverse Z-Transform of

5

$$X(z) = \frac{z}{2z^2 - 3z + 1}; \text{ROC } |z| > 1$$

b) Determine the impulse response of the following system using Z-transform method.

5

$$y(n) - \frac{3}{4}y(n-1) + \frac{1}{8}y(n-2) = x(n) + \frac{1}{3}x(n-1)$$

16 a) Explain classification of systems with example.

4

b) Find impulse response of the following continuous time system

6

$$\frac{d^2y(t)}{dt^2} + 6\frac{dy(t)}{dt} + 8y(t) = \frac{dx(t)}{dt} + x(t)$$

17 Write short notes on:

10

a) Sampling Theorem

b) Orthogonal Signal Space

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FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I-Semester (Old) Examination, Nov./Dec. 2018

SUBJECT: Digital Integrated Circuits and Applications

Time: 3 Hours

Max. Marks: 75

Note: Answer all questions from Part-A & any Five Questions from Part-B.

PART-A (25 Marks)

- | | |
|---|----|
| 1. State the advantages and disadvantages of Totem-pole output. | 3M |
| 2. What is the temperature ranges of 54xx and 74xx series TTL ICs? | 2M |
| 3. Draw and explain the CMOS inverter circuit. | 2M |
| 4. Discuss the characteristics of CMOS logic family. | 3M |
| 5. How does a priority encoder differ from an ordinary encoder? | 2M |
| 6. Design a full adder circuit using two 4x1 line multiplexers. | 3M |
| 7. Explain how an S-R Flip-Flop converted to D-Flip-Flop? | 2M |
| 8. Draw diagram of a 3-bit ring counter using D Flip-Flops. Draw timing diagram for count sequence. | 3M |
| 9. Draw internal structure of PLA. | 2M |
| 10. Distinguish between SRAM and DRAM. | 3M |

PART-B (5x10=50 Marks)

- | | |
|---|----|
| 11. a) Explain the working operation of a totem-pole TTL circuit with a neat sketch. | 6M |
| a) What are the advantages of multiple emitter transistor circuit? | 4M |
| 12. a) Draw the circuit of 2-input ECL OR/NOR gate and explain its operation. | 5M |
| b) Explain CMOS transmission gate and its applications. | 5M |
| 13. a) Design a 4-bit binary adder/subtractor using 7483 IC with suitable gates. | 5M |
| b) What is the principle of carry-look-ahead adder? Derive the two level equation for the output C ₄ . | 5M |
| 14. a) Design a mod-5 synchronous counter using JK-MS-FFs and draw timing diagram for a continuous clock. | 7M |
| b) A ripple counter is to operate at a max. frequency of 10 MHz. If the propagation delay of each flip-flop in the counter is 10 Nano seconds and the strobing time is 50 Nano seconds. How many stages can the counter have? | 3M |
| 15. a) Explain the operation of DRAM cell with read, write and refresh circuit. | 5M |
| b) The capacity of 512x8 SRAM is to be expanded to 2Kx8 SRAM. Find the number of chips required? Draw the structure of RAM expansion circuit. | 5M |
| 16. a) Explain CMOS to TTL interfacing circuit with a neat sketch. | 5M |
| b) Construct a 5x32 decoder/de-multiplexer tree using four 3x8 decoders and a 2x4 decoder circuit. | 5M |
| 17. Write short notes on | |
| a) Shift registers | 4M |
| b) Programmable logic devices | 3M |
| c) Flash Memories | 3M |

FACULTY OF ENGINEERING**B.E. 3/4 (ECE) I – Semester (Backlog) Examination, November / December 2018****Subject: Computer Organization and Architecture****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A & any five questions from Part – B.****PART – A (25 Marks)**

- 1 Describe the different addressing modes of general purpose computer. 2
- 2 Write the difference between arithmetic and logical right shift operation with an example. 3
- 3 What are the advantages of 2's complement over 1's complement number representation? 2
- 4 What is normalization and alignment of floating point arithmetic? 3
- 5 What are the merits and demerits of hardware control unit? 2
- 6 Distinguish between vertical and horizontal instruction formats. 3
- 7 Write the merits and demerits of programmed I/O and interrupt- initiated I/O 3
- 8 Explain HOLD and HLDA signals of DMA controller. 2
- 9 Explain pipelined and non-pipelined system with an example 3
- 10 What is superscalar architecture? 2

PART – B (50 Marks)

- 11 a) Design a 4-bit binary increment using four half adders. 5
b) Explain the complete operation of register transfers for the fetch phase with a necessary block diagram. 5
- 12 a) Draw the flow chart for fixed point binary addition/subtraction. 5
b) Design an array multiplier that multiplies two 2-bit numbers use AND gates and binary adders. 5
- 13 a) Distinguish between one-hot encoding and encoding scheme. 3
b) Show how a 9-bit micro operation field in a microinstruction can be divided into subfields to specify 46 micro operations. How many micro operations can be specified in one microinstruction? 4
c) Explain advantages and disadvantages of micro-programmed control unit. 3
- 14 a) Explain parallel priority interrupt in detail with relevant figure. 5
b) Explain in detail about Input – Output Processor. 5
- 15 a) What is pipelined conflict? Explain various types of pipelined conflicts with relevant examples. 5
b) Explain floating point pipelined adder with a flow chart. 5
- 16 a) What are the basic differences between a branch instruction, a call subroutine instruction and a program interrupt? 5
b) A computer used RAM chips of 1024X1 capacity 5
i) How many chips needed and how should their address lines be connected to provide a memory capacity of 1024 bytes? 5
ii) How many chips are needed to provide a memory capacity of 16k bytes? Explain in words how the chips are to be connected to the address. 5
- 17 Write short notes on any two of the following: 5
a) Interrupt cycle 5
b) Memory hierarchy 5
c) VLIW architecture. 5

FACULTY OF ENGINEERING**B.E. 3/4 (M/P/AE) I – Semester (Backlog) Examination, Nov. / Dec. 2018****Subject: Dynamics of Machines****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (25 Marks)**

- 1 State D'Alembert's Principle.
- 2 What are the conditions to be satisfied if two bodies are dynamically similar?
- 3 Mention the three elements of gyroscopic motion and how they are combined in balancing the bicycle?
- 4 Define coefficient of fluctuation of speed and fluctuation of energy?
- 5 State the function of a fly wheel in I.C. engine and in a punching machine.
- 6 State how multi cylinder engines are balanced?
- 7 Differentiate between static and dynamic balancing?
- 8 A shaft of 1mm diameter and 1m long is fixed at one end and other end carries a flywheel of mass 1tonne. Taking Young's modulus for the shaft material as 200 GN/m^2 , find the natural frequency of the longitudinal vibration.
- 9 State the terms:
 - i) Critical damping coefficient
 - ii) Damping Factor
 - iii) Logarithmic decrement
- 10 State the method of determination of natural frequency of a geared system.

PART – B (5x10 = 50 Marks)

- 11 A vertical double acting steam engine has a cylinder 300 mm diameters and 450 mm stroke and runs at 200 rpm. The reciprocating parts have a mass of 225kg and the piston rod is 50 mm diameter. The connecting rod is 1.2m long. When the crank has turned through 125° from the top dead centre position, the steam pressure above the piston is 30 kN/m^2 and below the piston is 1.5 kN/m^2 . Calculate the effective turning moment on the crank shaft.
- 12 In a spring controlled governor, the radial force acting on the ball was 4500N, when the centre of the balls was 200mm from the axis and 7500 N when at 300mm. Assuming that the force varies directly as the radius, find the radius of the ball path when the governor runs at 270rpm. Also find what alteration in spring load is required in order to make the governor isochronous and the speed at which it would then run. The mass of each ball is 30 kg.
- 13 A punching press is required to punch 40 mm diameter holes in a plate of 15mm thickness at the rate of 30 holes per minute. It requires 6N-m of energy per mm^2 of sheared area, If the punching takes 1/10 of a second and the rpm of the flywheel varies from 160 to 140, determine the mass of the flywheel having radius of gyration of 1m.

- 14 The following data refers to a two cylinder locomotive with cranks at 90° : Reciprocating mass per cylinder = 300kg, Crank radius = 0.3m: Driving wheel diameter = 1.8m; Distance between cylinder lines = 0.65m; Distance between the driving wheel centre planes = 1.55m. Determine: 1.the fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed 46kN at 96.5kmph; 2. The variation in tractive effort; and 3. The maximum swaying couple.
- 15 A shaft of diameter 10cm is supported by two bearings, which are 160 cm apart. It carries 3 pulleys of weight 600N, 500N, and 700 N, all within the span only. The pulley weighing 500 N is located at the mid span. This pulley weighing 600 N is 25cm from one bearing while the pulley weighing 700 N is 37 cm from the other bearing. Determine the critical speed of the shaft. Take $E = 1.96 \times 10^{11} \text{ N/m}^2$
- 16 A vertical steel shaft 15 mm diameter is held in long bearings 1 m apart. It carries in its Middle disc of 15 kg. Eccentricity of rotor is 0.3 mm. If the permissible tensile stress is 70 MN./m^2 ., find (i) critical speed of shaft (b) range of speeds unsafe to run. Neglect mass of shaft.
- 17 Write short notes on the following:
- Gyroscopic effects of a ship.
 - Rayleigh's method for multi rotor system.
 - Forced vibrations and Damped vibrations.

FACULTY OF ENGINEERING**B.E. 3/4 (CSE) I-Semester (Backlog) Examination, November / December 2018****Subject: Operating System****Time: 3 hours****Max. Marks: 75****Note:** Answer all questions from Part-A. Answer any FIVE questions from Part-B.**PART -A (Marks: 25)**

1. Define system call? 2
2. Distinguish between logical address and physical address? 2
3. Describe file system mounting? 2
4. What is Deadlock? 3
5. Discuss the criteria for choosing a file organization? 3
6. Distinguish between user threads and kernel threads? 3
7. Define real-time operating system? 2
8. State the benefits of a virtual memory system? 2
9. What is thrashing? How it can be prevented? 3
10. What is the difference between a binary semaphore and MUTEX? 3

PART – B (5x10= 50 Marks)

- 11 a) Define process. What is the information maintained in a PCB? 4
- b) Suppose the following jobs arrive for processing at the times indicated, each job will run the listed amount of time. 6

Jobs	Arrival Time	Burst Time (in secs)
1	0.0	8
2	0.4	4
3	1.0	1

Give Gantt chart illustrating the execution of these jobs using the non- pre-emptive FCFS and SJF scheduling algorithms. Compute the average turnaround time and average waiting time of each job for above algorithms.

- 12 a) Explain briefly about paging with neat diagram? 6
- b) Analyze that we have a paging system with page table stored in memory 4
 - i. If a memory reference takes 200 nanoseconds how long does a paged
 - i. If we add associative registers and 75% of all page table references are memory reference take found in the associative registers, what is the effective memory reference time? Assume that finding a page table entry in the associative registers takes zero time, if the entry is there.

- 13 a) Consider the following page reference string 7
 7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0
 Assuming three frames, how many page faults would occur in each of the following cases?
 a) LRU b) FIFO c) Optimal algorithms

Note that initially all frames are empty.

- b) List the common file types along with their extensions and describe each file type? 3
- 14 a) Define semaphore? Explain the method of application of semaphore for process synchronization? 3
- b) Consider the following snapshot of a system 7

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

Answer the following questions using the banker's algorithm:

- i) What is the content of matrix "Need"?
- ii) Is the system in a safe state?
- iii) If a request from process P1 arrives for (0, 4, 2, 0) can the request be
- 15 a) Consider the Work Queue: 23, 89, 132, 42, 187; there are 200 cylinders numbered from 0 - 199 and the diskhead starts at number 100. Calculate the total number of traversals made by each DISK Scheduling algorithm and conclude your observation by depicting algorithms in ascending order of traversals. 6
- b) List the steps in handling I/O interrupt along with a neatly labelled diagram 4
- 15 a) List and explain in short the design principles of Windows XP. 5
- b) Explain the architecture of Android OS along with a neatly labeled diagram. 5
- 17 Write Short Notes on any two of the following : 10
- a) Multithreaded programming
- b) free space management
- c) I/O system

FACULTY OF ENGINEERING**B.E. 3/4 (IT) I-Semester (Backlog) Examination, Nov. / Dec. 2018****Subject : Operating Systems****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from part –A and any five from Part-B****Part-A (25 Marks)**

- | | |
|---|---|
| 1. What are the merits and demerits of multiprocessor systems | 2 |
| 2. What is a PCB? Draw its Structure | 3 |
| 3. What is the difference between system programs and system calls? | 3 |
| 4. What is demand paging? | 2 |
| 5. What is an access matrix and why it is used? | 3 |
| 6. What is encryption? | 2 |
| 7. Explain about directing structure. | 3 |
| 8. Define lady's Anomaly. | 2 |
| 9. List the operations performed on directories. | 2 |
| 10. What is thrashing? Explain. | 3 |

PART – B (5x10=50 Marks)

- | | |
|---|----|
| 11. a) Discuss various states in which a process can exist with the help of a state diagram | 5 |
| b) What are two models of IPC? Explain briefly. | 5 |
| 12 a) What is thread? What are the benefits of multi threading | 5 |
| b) Explain about various multi multithreading models | 5 |
| 13 a) What is paging. Explain any one paging mechanizing | 5 |
| b) What are the major activities of OS in regard to fill management | 5 |
| 14 a) Explain about FCFS and SJF in detail | 5 |
| b) Explain about various methods for handling dead locks. | 5 |
| 15 Explain about various page replacement Algorithms | 10 |
| 16 a) Explain about the various file allocation techniques | 5 |
| b) Explain mono cryptography in used as a security tool | 5 |
| 17 Write a short notes on the following | 10 |
| a) RAID structure | |
| b) Pass words | |

FACULTY OF ENGINEERING

B.E. (Civil) V – Semester (CBCS) (Main) Examination, Nov. / Dec. 2018

Subject: Theory of Structure – 1

Time: 3 Hours

Max.Marks: 70

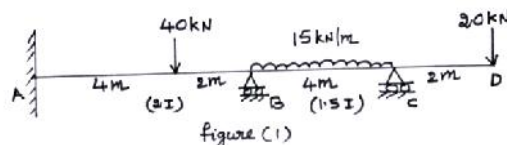
Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (10x2 = 20 Marks)

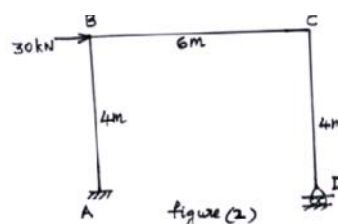
- 1 Define Absolute stiffness and Relative stiffness
- 2 State the reasons for developing sway moments in portal frame
- 3 What are the limitations of Slope deflection method?
- 4 A propped cantilever beam of span 3m subjected to a point load of 20kN at the centre. Compute bending moment at fixed support using moment distribution method.
- 5 What are the advantages of kani's method over moment distribution method?
- 6 What is the ratio of stiffness of a member when far end is hinged to that of the member when the far end is fixed?
- 7 State the difference between strain energy method and unit load method in the determination of deflection of structures.
- 8 What are the assumptions made in the unit load method?
- 9 State Eddy's theorem.
- 10 What is the effect of temperature on three hinged and two hinged arches?

PART – B (5x10 = 50 Marks)

- 11 Analyse the continuous beam shown in the figure (1) by slope deflection method and draw BMD and SFD.



- 12 Draw the BMD for the frame as shown in the figure(2) by moment distribution method.



- 13 Draw the BMD for the beam as shown in the figure(3) by Kani's method. During loading support 'B' sinks by 10mm. Take $EI = 20,000\text{kN}\cdot\text{m}^2$.

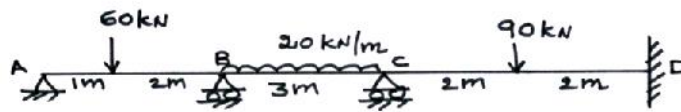


Figure (3)

- 14 Draw BMD for the frame shown in Figure (4) as shown below by moment distribution method.

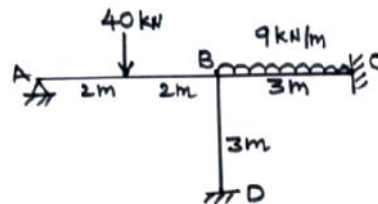


Figure (4)

- 15 Find the forces in all the members of the truss shown in figure(5). AE is constant for all members.

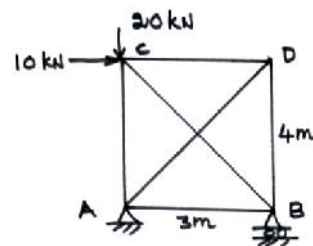


Figure (5)

- 16 A three hinged parabolic arch of span 60m and rise 9m carries a point load of 90kN at a distance of 10m from left end and an UDL of 10kN/m acting from crown to right end. Find radial shear, normal thrust and bending moment at 40m from the left support.

- 17 Draw BMD for the frame as shown in the figure(6) using slope deflection method.

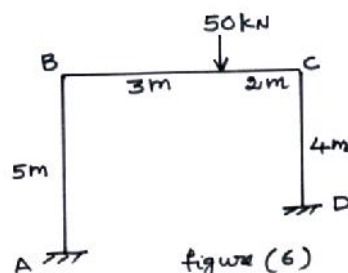


Figure (6)

FACULTY OF ENGINEERING**B.E. (EEE / Inst.) V – Semester (CBCS) (Main) Examination, Nov. / Dec. 2018****Subject: Digital Signal Processing & Applications****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (10x2 = 20 Marks)**

- 1 Analyze whether the following system is Causal or Non Causal. (2)
 $y(n) = x(n) + x(n-2)$
- 2 Determine the Z-transform and ROC of the following signal. (2)
 $x(n) = 3^n \cdot u(n)$
- 3 Compute the circular convolution of the following signals. (2)
 $x(n) = \{1, 2, 3, 4\}, h(n) = \{1, 1, 1, 1\}$
- 4 Write down the two properties of twiddle factor $W_N = e^{-j2\pi/N}$ in FFT. (2)
- 5 What is prewarping in IIR filter designing? (2)
- 6 Compare Butterworth and Chebyshev IIR filters. (2)
- 7 Write down the sufficient conditions for FIR filter to have linear phase characteristics. (2)
- 8 Write the mathematical representation of down-sampler in multirate signal processing. (2)
- 9 Explain different applications of Digital Signal processors. (2)
- 10 Compare Digital Signal Processors over conventional Microprocessors. (2)

PART – B (5x10 = 50 Marks)

- 11 a) Analyze the stability and causality of the following discrete time systems (5)
i) $y(n) = a^{x(n)}$ ii) $h(n) = 2^n \cdot u(n)$
- b) Determine the inverse z-transform of the following function (5)
$$X(z) = \frac{z^{-1}}{3 - 4z^{-1} + z^{-2}}; \text{ROC } |z| > 1$$
- 12 a) Determine the 4-point DFT of the following signal (5)
 $x(n) = \{1, -2, 3, 2\}$
- b) Compute the 4-point DFT using DITFFT of the following sequence. (5)
 $x(n) = \{1, 1, 1, 0\}$
- 13 Design a digital low pass Butterworth IIR filter to give response of attenuation of 3 dB or less upto 2kHz and attenuation of 20dB or more beyond 4kHz. Use bilinear transformation to obtain $H(z)$. (10)
- 14 Design a digital High pass FIR filter using Hamming window function by taking N=9 samples of the window function and with a cut-off frequency of 1.2 rad/sec. (10)

- 15 Explain the architecture of TMS320C5X DSP processor with neat block diagram. (10)
- 16 a) Obtain the impulse response of the following difference equation using Z-transform
$$y(n) - 3y(n-1) - 4y(n-2) = x(n) + 2x(n-1) \quad (5)$$
- b) Obtain the Direct form-I structure realization of the following discrete time system given by the difference equation
$$y(n) = -\frac{13}{12}y(n-1) - \frac{9}{24}y(n-2) - \frac{1}{24}y(n-3) + x(n) + 4x(n-1) + 3x(n-2) \quad (5)$$
- 17 Write short notes on: (10)
- Sampling Theorem
 - Application of Digital Signal Processing to Speech Processing.

FACULTY OF ENGINEERING

B.E. (Prod.) V-Semester (CBCS) (Main) Examination November/December 2018

Subject: Metal Forming Technology

Time: 3 Hours

Max. Marks 70

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

- 1 What do you understand by plasticity cycle? Sketch.
- 2 Compare the hot features working with the cold working process.
- 3 What Meant by Edge bending? Explain briefly.
- 4 Sketch and label the combination die.
- 5 What is flow forming? Explain briefly.
- 6 Write the advantages and application of Press forging.
- 7 Enlist various types of forging hammers.
- 8 What are the common defects observed in forged products.
- 9 Sketch the roll pass sequence for bar.
- 10 How plot the. Sketch 3-high roll mill.

PART – B (50 Marks)

- 11 (a) Define recrystallization temperature. Explain its significance in Metal Forming operations.
(b) Discuss the phenomenon of yielding of a ductile material under bi-axial state of stress.
- 12 (a) What are the various types of presses used in Sheet metal works? Explain any one in detail.
(b) Explain the bending operation with a neat sketch. Write the expression for Bending Allowance.
- 13 (a) Differentiate clearly between forward and backward extrusion process with a neat sketch.
(b) Discuss the selection of die materials for extrusion process.
- 14 (a) Explain operation and principle of Stretch forming with the help of a neat sketch.
(b) Describe the principle of wire drawing operation with a neat sketch.
- 15 (a) Sketch and explain the principle of Isothermal forging. Mention its applications.
(b) Describe working of drop forging hammer with a neat sketch.
- 16 (a) Determine the roll force and power required for rolling a copper strip of 120 mm long 12 mm wide and 2 mm thick. The roll radius in 150 mm and the rolls rotate at 100 rpm.
(b) Sketch and label the elements of a Cluster Rolling Mills.
- 17 Write short notes on any TWO of the following:
 - (a) Tube drawing process.
 - (b) Extrusion Dies.
 - (c) Power rolling.

FACULTY OF ENGINEERING**B.E. (ECE) V – Semester (CBCS) (Main) Examination November/ December 2018****Subject: Analog Communication****Time: 3 Hours****Max. Marks: 70****Note: Answer all the questions from Part A and any five questions from Part B.****Part – A (20 Marks)**

1. Define the transmission efficiency of AM signal.
2. The output power of an AM transmitter is 1 KW when sinusoidally modulated to a depth of 100%. Calculate the power in each side band when the modulation depth is reduced to 50%.
3. Explain capture effect.
4. For an FM modulator with a peak frequency deviation $f = 20$ kHz, a modulating signal frequency $f_m = 10$ kHz. Find the bandwidth using carson's rule.
5. What do you mean by Image frequency?
6. Classify Radio transmitters.
7. What are external and internal noises?
8. Define Signal to noise ratio and noise figure of a receiver.
9. Explain briefly about flat top sampling.
10. How is PDM wave converted into PPM system?

Part – B (50 Marks)

11. a) Explain the phase-shift method of SSB generation with the help of neat block diagram. 6M
 b) The antenna current of an AM transmitter is 8 amperes(8A) when only the carrier is sent, but it increases to 8.93 A. When the carrier is modulated by a single sine wave. Find the percentage modulation. Determine the antenna current when the percentage of modulation changes to 0.8. 4M
12. a) Derive the expression for the Frequency modulation. Explain the relationship between FM and PM 5M
 b) Explain the Balanced slope detector for the FM demodulation. 5M
13. a) What is Pulse Amplitude Modulation (PAM)? Discuss the mathematical analysis. 5M
 b) Define and describe Pulse Position Modulation and explain with Waveform how it is derived from PWM. 5M
14. a) Explain in brief, the factors must be considered while selecting the intermediate frequency in radio receiver. What is the value of IF choosed in India for radio broadcasting? 5 M
 b) Discuss the advantages of super heterodyne receiver over the TRF receiver. 5M

15. a) Find Figure of merit for AM modulation. 6M
- b) A receiver connected to an antenna whose resistance is 50Ω has an equivalent noise resistance of 30Ω . Calculate the receiver's noise figure in decibels and its equivalent noise temperature. 4M
16. a) Derive the mathematic expression for double side band suppressed Carrier. (DSB-SC) 4M
- b) What is the need of the following in a radio receiver, explain giving examples: (AGC) (ii) Mixer (iii) Intermediate amplifier. 6M
17. a) In which system pre-emphasis and de-emphasis are used? Also explain its operation. 5M
- b) What is noise? What are internal and external noise and briefly discuss them? 5M

FACULTY OF ENGINEERING

B.E. (A.E.) V-Semester (CBCS) (Main) Examination, November/December 2018

Subject: Automotive Diesel Engines

Time: 3 Hours

Max. Marks 70

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

- 1 Define ignition quality.
- 2 What are the important qualities of C.I. engine fuel?
- 3 Define unit injector and Ignition lag.
- 4 Name the different types of fuel injectors used in diesel engines.
- 5 What is the importance of Swirl in an engine?
- 6 Define delay period.
- 7 What is the need of Super charging.
- 8 Define turbo-lag.
- 9 What are the emissions coming out of engine exhaust?
- 10 Draw the performance maps of diesel engine.

PART – B (50 Marks)

- 11 Derive an expression for thermal efficiency and mean effective pressure for the air standard diesel cycle.
- 12 (a) List the major differences between actual cycles and air standard cycles.
(b) What are the main requirements of fuel injection system.
- 13 (a) What are the design objectives of diesel engine combustion chambers.
(b) Explain knocking in C.I. engines.
- 14 (a) What are parameters which effect the delay period and explain each in detail.
(b) With a suitable sketch explain about turbo charging.
- 15 Explain the variables that effect the performance of an automotive diesel engine and describe how engine performance maps are obtained.
- 16 What are the different methods to analyze the exhaust gases and explain each of them.
- 17 Write short notes on the following:
 - (a) Laboratory tests for diesel fuel.
 - (b) Knocking in C.I. engines.
 - (c) Heat balance sheet.

FACULTY OF ENGINEERING

B.E. (Mech.) V - Semester (CBCS) (Main) Examination, November/December 2018

Subject: Manufacturing Processes

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part A and any five questions from Part B.

PART – A (10x2 = 20 Marks)

1. Define shrinkage and porosity.
2. Name 4 defects in casting.
3. What properties vary in permanent mold and sand casting?
4. State four reasons for having so many varieties of casting methods.
5. What are functions of flux in submerged arc welding?
6. What is the primary goal of objective in bulk welding?
7. What is the practical limit of the thickness of material that can be readily spot welded?
8. Define roll gap, neutral point, draft with sketch.
9. What are advantages of tandem rolling?
10. What is a flash in forging?

PART – B (5x10=50 Marks)

11. a) Explain the Chvorinov principle of prediction the solidification of casting.
b) Explain 10 pattern allowances in production of casting.
12. a) Explain the step by step procedure for die casting.
b) Explain the process of semi-centrifugal casting.
13. a) Describe the metal transfer that occurs during pulsed arc gas metal arc welding.
b) What three basic types of current and polarity are used in arc welding?
14. a) What are three components that contribute to the total resistance between the electrodes.
b) Explain the various occurring in arc welding process-sketch.
15. a) Explain different type of forging presses with sketch.
b) Explain the tube extrusion process.
16. a) Describe the factors affecting the rolling forces.
b) Sketch and explain thread rolling process.
17. a) Sketch 10 extruded shapes with sketches.
b) Design consideration of forging die design – Explain.

FACULTY OF ENGINEERING**B.E. (IT) V-Semester (CBCS) (Main) Examination, Nov. / Dec. 2018****Subject : Database Systems****Time : 3 hours****Max. Marks : 70****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (10x 2 = 20 Marks)**

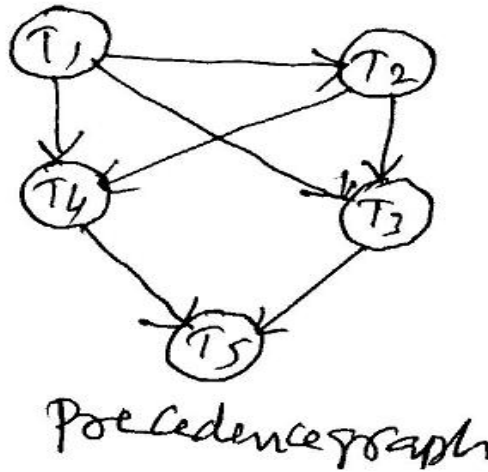
- 1 List two disadvantages associated with database systems.
- 2 Outline what sort of redundancy will results, if a weak entity set is made a strong entity set.
- 3 Give an expression in SQL to find the company that has the most employees for the following employee database. Primary keys are underlined.
Employee (employee-name, street, city)
Works (employee-name, company-name, salary)
Company (company-name, city)
Manager (employee-name, manager-name)
- 4 What SET operations on relations are supported in SQL?
- 5 What is the need of TRIGGERS in SQL?
- 6 Why NORMALISATION?
- 7 Explain why it is usually a bad idea to create indices on every attribute, and every combination of attributes, that is a potential search keep.
- 8 What is storage structure?
- 9 Explain Thomas' write rule.
- 10 Explain the difference between three storage types volatile, non-volatile and stable-in terms of I/O cost.

PART – B (5 x 10 = 50 Marks)

- 11 a) Explain the various components of a database system and connection among them with a neat diagram. 5
- b) Construct an E-R diagram for a AIRLINE. 5
- 12 a) Explain the concept of joins with an example. 7
- b) List the reasons why NULL values might be introduced into the database. 3

- 2 -

- 13 a) Explain the approaches to accessing SQL from a general purpose programming language. 5
 b) Explain BCNF with an example. 5
- 14 a) Construct a B+ tree for the following search key values with pointer = 4. 5
 2 3 5 7 11 17 19 23 29 31
- b) Consider the below precedence graph. Is the schedule conflict serializable? Explain your answer. 5



- 15 a) Discuss Deadlock handling with an example. 5
 b) Explain ARIES recover algorithm. 5
- 16 Explain Dynamic hashing with an example. 10
- 17 Write short notes on the following :
 a) Views 4
 b) Bitmap Indices 3
 c) Nested sub-queries 3

FACULTY OF ENGINEERING

B.E. V-Semester (CBCS) (CSE) (Main) Examination, Nov./Dec. 2018

Subject: Data Communications

Time: 3 Hours

Max. Marks: 70

Note: Answer all the questions from Part-A, & any five Questions from Part-B

Part – A (10x2=20 Marks)

1. Define Data Communication Model and Protocol Architecture. [2M]
2. For the bit stream 11001010 Sketch the wave form of any two digital signal encoding formats. [2M]
3. Define single bit errors and burst errors. [2M]
4. What are the 3 data transfer modes defined in HDLC [2M]
5. Enumerate different types of multiplexing techniques. [2M]
6. What are the characteristics of VCC? [2M]
7. List some basic functions performed at the MAC Layer. [2M]
8. What is the need of CSMA/CD? [2M]
9. What is the principle of frequency reuse technique in context of a Cellular Network? [2M]
10. Differentiate between bridges and switches. [2M]

Part – B (5x10=50 Marks)

11. a) List the service layers of OSI Model and explain the functionalities. [6M]
b) Explain guided transmission media and its characteristics. [4M]
12. a) Explain CRC with an example. [6M]
b) Explain EIA – 232 in respect of four important characteristics. [4M]
13. a) Elaborate various methods of Multiplexing. [5M]
b) Differentiate circuit switching from packet switching with timing diagram [5M]
14. a) Write about layer 2 and layer 3 switches. [5M]
b) Explain briefly about Gigabit Ethernet. [5M]
15. a) Write about IEEE 802.11 architecture. [5M]
b) Explain the architecture of Bluetooth technology. [5M]
16. a) Explain transmission impairments. [5M]
b) What is need of PCM? Explain the concept of sliding window protocol. [5M]
17. Write short notes on any two of the following.
 - a) ATM Cell header format. [5M]
 - b) HDLC [5M]
 - c) DSSS [5M]