Code No. 2083

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I – Semester (Backlog) Examination, December 2019

Subject: Fluid Mechanics – II

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

Note: Answer all questions from Part-A and any five questions from Part-B. Missing data, if any, may suitably be assumed.

PART – A (25 Marks)

1 Write is critical depth? Write its mathematical expression. [2]

2 Explain the significance of the velocity distribution in a channel section. [3]

3 Determine critical depth of flow for a hydraulic jump formed in a rectangular channel with the depths of flow before and after the jump as 0.5m and 2.0m respectively. [3]

4 What is a surge? Write about the different types of surges. [2]

5 Explain the different methods of controlling the boundary layer formation. [3]

6 Define streamlined and bluff bodies. [2]

7 What is dimensional homogeneity? [2]

8 Find the force exerted by a jet of water of 10cm diameter which impinges normally on a fixed plate with a velocity of 20m/s. [3]

9 Briefly explain about the tangential flow and radial flow turbine. [3]

10 Define the terms manometric efficiency and mechanical efficiency of a centrifugal pump. [2]

PART – B (5x10 = 50 Marks)

11 a) Derive the Chezy's formula for uniform flow in an open channel. [5]

b) An irrigation channel of trapezoidal section with side slopes of 3 hor. to 2 ver. is to carry a discharge of $10m^3/s$ on a bed slope of 1 in 5000. Find the dimensions of the most economical section of the channel taking n=0.012. [5]

12 a) Derive the momentum equation for a jump in a horizontal rectangular channel. [5]

b) A rectangular flume 4m wide carries discharge at the rate of $10m^3/s$. The bed slope of the flume is 0.0004. At a certain section, the depth of the flow is 2m. Calculate the distance of the section downstream where the depth of the flow is 0.8 m. Assume rugosity coefficient as 0.014. Solve by single step method. [5]

13 a) What is boundary layer separation? Explain this concept with the help of boundary layer growth on a curved surface. [5]

B) Find the rise in pressure due to sudden closure of valve in a pipe of diameter of 180mm, thickness 8mm and through which a discharge of 25 l/s takes place. Take modulus of elasticity for pipe material as 2×10^6 N/mm^2 and bulk modulus of water as 2×10^3 N/mm^2. [5]

..2

14 a) State and explain the three types of similarities that exists between the model and the prototype. [5]

b) The pressure difference Δp in a pipe of diameter D and length l due to viscous flow depends on the velocity v, viscosity μ and density ρ. Using Buckingham's ® theorem, obtain the expression for pressure difference. [5]

15 a) Draw a schematic diagram of Francis turbine and explain briefly its construction and working. [5]

b) A centrifugal pump delivers 0.03 m^3/s of water to a height of 18.25 m through a 100 mm diameter pipe, 90 metres long. If the overall efficiency of the pump is 75%, find the power required to drive the pump. Take Darcy's f= 0.01. [5]

16 a) Write in detail, the classification of turbines with various considerations. [5]

b) A Pelton wheel is designed for the following data. [5]
Power to be developed = 6000 KW
Net Head available = 300 m
Speed = 550 rpm
Ratio of jet dia to wheel dia =1/10
Overall efficiency = 85%
Find:
i) No of jets
ii) Diameter of jet
iii) Diameter of the wheel.

17 Write short notes on the following: [10]
a) Water hammer phenomenon.
b) Types of surface flow profiles.
c) Specific speed of a Centrifugal Pump.

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Code No. 2089

FACULTY OF ENGINEERING

B.E ¾ I – Semester (EEE) (Backlog) Examination, Dec 2019

Subject: Electrical Machinery – II

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

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

PART – A (25 Marks)

1 Discuss the relative merits and demerits of an Auto transformer? [3M]

2 Why different phase conversions are required in three phase transformer? [2M]

3 While connecting transformers in parallel, what factors must be taken in considerations? [3M]

4 What is the purpose of conducting Routine Test on transformer? [2M]

5 Draw the equivalent circuit of 3-ϕ induction motor? [3M]

6 Define Slip and Rotor current frequency of 3- ϕ induction motor? [2M]

7 What is the need of starting for 3-ϕ induction motor? [2M]

8 What are the various speed control techniques for 3- ϕ induction motor? [3M]

9 What is 'Single Phasing' of 3- ϕ induction motor? [2M]

10 What are the effects of 3-ϕ Transformer when one phase voltage is low? [3M]

PART – B (50 Marks)

11 Two 1-ϕ Scott-connected transformers supply a 3-ϕ four wire distribution system with 231v between lines and neutral. The h.v. windings are connected to a two phase system with a phase voltage of 6600v. Determine the number of turns in each section of the h.v. and l.v. windings and the position of the neutral point if the induced voltage per turn is 8v. [10M]

12 (a) Write short notes on 'Maintenance of transformers'? [3M]

(b) A load of 1400kVA at 0.866 p.f. lagging is supplied by two 3-ϕ transformers of 1000kVA and 500kVA capacity operating in parallel. The ration of transformation is the same in both 6600/400 delta-star. If the equivalent secondary impedances are (0.001+j0.003) ohm & (0.0028+j0.005) ohm per phase respectively. Calculate the load and p.f. of each transformer? [7M]

13 (a) Explain how to obtain the equivalent circuit parameters of a 3-ϕ induction motor from its test results? [5M]

(b) The input to a 3-ϕ induction motor is 65kW and the stator loss is 1kW. Find the mechanical power developed and rotor Cu losses per phase at a slip of 3%. [5M]

14 (a) Explain the Speed control of 3-ϕ induction motor with the help of neat diagrams using 'Pole changing method'. [5M]

contd..2

(b) Explain the slip power recovery scheme method used for slip ring induction motor? [5M]

15 (a) Explain unbalanced operation of 3-ϕ induction motor? [5M]

(b) Explain Constructional features of 3-ϕ transformer? [5M]

16 Explain the following:

(a) Cascading method of speed control of 3-ϕ induction motor [5M]

(b) Scott-Connected Transformer. [5M]

17 Explain the following with neat diagram:

(a) No – load Tap changing Transformer [5M]

(b) Torque – Speed Curve for 3-ϕ IM. [5M]

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Code No. 2095

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) I - Semester (Backlog) Examination, December 2019

Subject : Signal and Systems

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

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

PART – A (25 Marks)

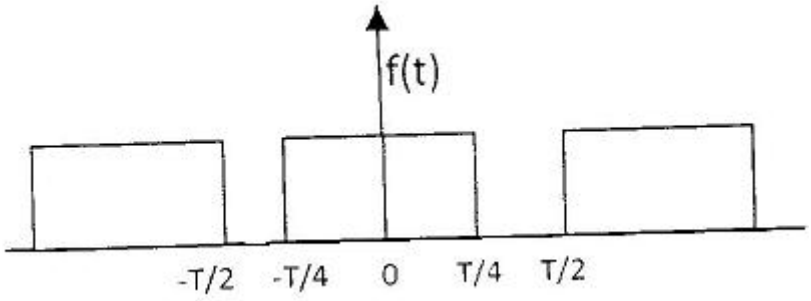
1	Find even and odd component of the signal $x(t) = e^{J2\pi t}$.		3
2	Find the periodicity of the given signal $x(t) = \sin 12\pi t$, also find it's period.		2
3	Determine complex exponential Fourier series coefficient for $x(t) = \sin \omega_0 t$.		3
4	Write the relationship between Trigonometric and Exponential Fourier series.		2
5	Prove the frequency shifting property of Fourier Transform.		3
6	Find the Fourier Transform of $x(t) = e^{-at}$ .u(t) for a>0.		2
7	Find the Laplace Transform of signal $x(t)=e^{-a\|t\|}$.		3
8	Explain the relation between Laplace Transform and Fourier Transform.		2
9	Find Z-transform of signal $x(n) = (-1)^n 3^{-n} u(n)$. $h(n) = (-1)^n 3^{-n} u(n-1)$		3
10	Define ROC for Z-transform.		2

PART – B (50 Marks)

11	a)	Explain classification of systems with examples.	5
	b)	Find convolution of the following two sequences.	5

$x(n) = \{1, -2, 1\}$, $h(n) = \{1, 2, 3, 2, 1\}$.

12 Find the Trigonometric Fourier series of the following waveform. 10



13	a)	Determine the convolution of the following signal using Fourier Transform.	6

$x_1(t) = e^{-2t}$ .u(t) and $x_2(t) = e^{-6t}$ .u(t)

	b)	Find Fourier transform of a gate function.	4
14	a)	Find the step response of the following system	5

$$H(s) = \frac{(s+3)}{(s^2+6s+8)}$$

	b)	State and prove any three properties of Laplace Transform.	5

..2

15 a) Find inverse Z-transform of 5

$$X(z) = \frac{(2z-7)}{(z^2-5z+6)}; |z| < 2$$

b) State and prove final value theorem of Laplace Transform. 5

16 a) Find Z transform of 5

i) x(n) = nu(n) ii) x(n) = cos ωn

b) Explain Parseval's theorem for Fourier transform. 5

17 Write short notes on : 10

a) Sampling theorem

b) Dirichlets conditions

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Code No: 2102/O

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I – Semester (Old) Examination, December 2019

Subject: Digital Integrated Circuits & 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	Distinguish between Linear ICs and Digital ICs.	2M
2	Write the advantages of open collector output over totem pole arrangement	2M
3	Draw CMOS NOR gate.	3M
4	Write the differences between decoder and demultiplexer.	2M
5	Convert D Fliflop to T Flipflop.	3M
6	Distinguish between combinational & Sequential circuits.	3M
7	What is lock out condition in counter and how to avoid it.	3M
8	Draw the architecture of ROM.	2M
9	Design a full adder circuit using two 4x1 multiplexers.	3M
10	Write short notes on flash memory.	2M

PART – B (5X10=50 Marks)

11	a) Explain the operation of tri state logic circuit with neat sketch.	6M
	b) What are the advantages of multiple emitter transistor circuit.	4M
12	a) Explain IC interfacing techniques for CMOS to TTL logic families and TTL to CMOS logic families.	6M
	b) Explain CMOS bilateral switch.	4M
13.	Design and explain the operation of BCD to 7-segment decoder driver.	10M
14.	a) Design MOD-12 asynchronous counter using JK FFs.	7M
	b) Write the applications of Universal Shift Register.	3M
15.	a) Explain the operation of SRAM cell with a neat sketch.	7M
	b) Design 16K x 8 EPROM using two 8K x 8 (2764) ICs.	3M
16.	Implement the following function using PROM, PLA, PAL $f_1(a,b,c) = \sum m\ (0, 1, 3, 6, 7)$ $f_2(a,b,c) = \sum m\ (2, 3, 4, 5)$ $f_3(a,b,c) = \sum m\ (0, 1, 2, 3, 4, 5, 6, 7)$	10M
17.	Write short notes on any two of the following a) Shift Registers b) Expanding word size and capacity c) look-ahead adder	10M

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Code No. 2097

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I - Semester (Backlog) Examination, December 2019

Subject : Computer Organization and Architecture

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

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

PART – A (25 Marks)

1	Draw the block diagram of a 4-bit combinational circuit shifter and write its truth table.	3
2	Show the hardware for implementing Booth's algorithm.	3
3	Define micro operation and micro instruction.	2
4	Discuss various types of CPU organizations.	3
5	What are the basic differences between a branch instruction, a call subroutine instruction and program interrupt?	3
6	Determine the number of clock cycles to process 200 tasks in a six-segment pipeline.	2
7	What is the difference between I/O mapped I/O and memory-mapped I/O?	2
8	Explain the need for an I/O interface.	2
9	How CAM is different from read/write memory?	2
10	What do you mean by a page fault? Which hardware is responsible for detecting the page fault?	3

PART – B (50 Marks)

11	a)	Draw the flow chart for a sign magnitude addition and subtraction algorithm.	5
	b)	Design a 4-bit combinational circuit for incrementer/decrementer using full adders.	5
12	a)	Explain the common bus system of a basic computer with a neat sketch.	6
	b)	Explain the operation of an address sequencer in a microprogrammed control.	4
13	a)	Explain instruction formats for various types of computer organizations as single accumulator, general register and stack.	6
	b)	Compare CISC and RISC architectures.	4
14	a)	Explain the operation of Daisy chaining method of priority interrupt.	6
	b)	Write the sequence of steps to be followed for DMA transfer.	4
15	a)	Why page-table is required in a virtual memory system? Explain different ways of organizing a page table.	5
	b)	What do you mean by memory hierarchy? Describe in detail.	5
16	a)	Explain pipeline conflicts and discuss the remedies for those conflicts.	6
	b)	Explain any four data manipulation instructions.	4
17	Write short note on any two of the following :		10
	a)	CPU-IOP communication	
	b)	Cache memory	
	c)	VLIW architecture	

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Code No. 2105

FACULTY OF ENGINEERING

B.E. 3/4 (M/P / AE) I – Semester (Backlog) Examination, December 2019

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 What will be the effect of the gyroscopic couple on a disc fixed at a certain angle to a rotating shaft? [2]

2 What is the difference between piston effort, crank effort and crank-pin effort? [3]

3 Define and explain the terms relating to governors:
i) Stability,
ii) Sensitiveness, and
iii) Hunting. [3]

4 Explain the term coefficient of fluctuation of energy. [2]

5 What are in-line engines? How are they balanced? It is possible to balance them completely? [2]

6 Explain the role of reference plane in balancing masses of rotation in different planes. [2]

7 Define, in short, free vibrations, forced vibrations and damped vibrations. [3]

8 Explain the term 'Logarithmic decrement' as applied to damped vibrations. [2]

9 Define torsinally equivalent shaft. [3]

10 Define the term 'node' and explain how it is obtained. [3]

PART – B (5x10 = 50 Marks)

11 a) Explain the gyroscopic effect of pitching and rolling of a ship in the sea water.
b) A horizontal steam engine running at 240 r.p.m. has a bore of 300 mm and stroke 600 mm. The connecting rod is 1.05 m long and the mass of reciprocating parts is 60 kg. When the crank is 60° past its inner dead centre, the steam pressure on the cover side of the piston is 1.125 N/mm^2 while that on the crank side is 0.125 N/mm^2. Neglecting the area of the piston rod, determine: (i) the force in the piston rod, and (ii) the turning moment on the crankshaft. [4+6]

12 A loaded Porter governor has four links each 250 mm long, two revolving masses each of 3 kg and a central dead weight of mass 20 kg. All the links are attached to respective sleeves at radial distances of 40 mm from the axis of rotation. The masses revolve at a radius of 150 mm at minimum speed and at a radius of 200 mm at maximum speed. Determine the range of speed. [10]

13 a) Write a short note on balancing of locomotives.

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance. [4+6]

14 a) Explain the term 'Damping factor'.

b) A cantilever shaft 50 mm diameter and 300 mm long has a disc of mass 100 kg at its free end. The Young's modulus for the shaft material is 200 GN/m^2. Determine the frequency of longitudinal and transverse vibrations of the shaft. [4+6]

15 A mass of 7.5 kg hangs from a spring and makes damped oscillations. The time for 60 oscillations is 35 seconds and the ratio of the first and seventh displacement is 2.5. Find (a) the stiffness of the spring, and (b) the damping resistance in N-m/s. If the oscillations are critically damped, what is the damping resistance required in N-m/s? [10]

16 Explain two rotor and three rotor vibrations. [10]

17 Write a short note on the following. [10]
a) Hartnell and Hartung governor.
b) Balancing of radial engines.
c) Types of damping.

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Code No: 2117

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) I Semester (Backlog) Examination, December 2019

Subject: Operating 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 Discuss the view of an operating system as a resource manager? (2)

2 Distinguish between preemptive and non-preemptive scheduling techniques? (3)

3 Define demand paging. (3)

4 What are the functions of dispatcher? (2)

5 Explain the goals of protection? (2)

6 Define race condition with an example. (3)

7 What do you understand by Rotational latency? (2)

8 Differentiate between maskable and non-maskable interrupts. (2)

9 What is the use of plug-and-play manager in Windows XP? (3)

10 How security issues are addressed in Linux? (3)

PART – B (5 x 10 = 50 Marks)

11 Explain CPU scheduling Algorithms (10)
i) FCFS
ii) SJF
iii) Priority
iv) RR for the following example.

Process	Burst Time	Arrival Time	Priority
P1	25	0	3
P2	10	1	1
P3	5	2	2

12 a) What is file? What are the attributes of a file? (5)
b) Discuss about various file allocation methods. (5)

13 a) What are monitors? Give the solution to dining philosopher problem using monitor. (5)
b) Explain different methods of recovery from deadlocks. (5)

14) A disk drive has 1000 cylinders which are numbered 0 to 999 currently the drive is seeking request at 130. Previous request served was at cylinder 150. The pendingRequest in FIFO order in the queue are; 86, 470, 913, 774, 948, 509, 22, and 750.Compute the total disk arm movement made to serve all the requests using the following methods and depict the arm movement under each method.
i) FCFS
ii) SSTF / Elevator
iv) SCAN
iv) C-SCAN (10)

……..2

15) a) Explain the steps of transforming an I/O request to hardware operations. (5)
b) Write about I/O Hardware. (5)

16) a) List and explain the components of Linux System. (5)
b) What are the different file systems supported by Linux? (5)

17) Write short notes on the following (10)
a) File system Mounting
b) Android OS.

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Code No: 2122

FACULTY OF ENGINEERING

B.E. 3/4 (I.T.) I-Semester (Backlog) Examination, December 2019

Subject: Operating 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. Differentiate between Process and Thread? (3)
2. What is a system call? List the types of System Calls? (3)
3. Discuss the criteria used to evaluate the CPU scheduling algorithm? (2)
4. Distinguish between Binary Semaphore and Counting Semaphore? (3)
5. What is Critical Section Problem? (2)
6. What is Belady's Anamaly? Which page replacement algorithm suffers from Belady's Anamaly? (2)
7. What is Thrashing? Give reasons of thrashing? (2)
8. What is File Mounting? (3)
9. Give the Computer Security Classification? (3)
10. Define an Access Matrix? (2)

PART – B (5 x 10 = 50 Marks)

11. Consider the following set of processes (10)

Process	Burst Time	Priority	Arrival Time
P1	10	3	0
P2	1	1(H)	2
P3	2	3	3
P4	1	4(L)	1
P5	5	2	1

(i) Draw the Gantt Charts that illustrates the execution of these processes using following scheduling algorithms:FCFS,SJF(Preemtive),PRIORITY(Non-Preemptive) and Round Robin(quantum=2ms)

(ii) Compute Turnaround Time and Waiting Time for each of the algorithm

12. (a) Find the number of Page Faults in FIFO.LRU,OPTIMAL page replacement algorithms for the following reference string (Assuming Frame Size as 3)? 7,0,2,1,3,4,2,1,0,2,1,4,3,2,1,0,0,1,2,1 (6)

(b) Describe various File Allocation methods? (4)

13. (a) Explain the Bankers Algorithm for Deadlock Avoidance for the following example and Find the Safe Sequence. (6)

Process	Max			Allocation			Available		
	A	***B***	***C***	***A***	***B***	***C***	***A***	***B***	***C***
P0	7	5	3	0	1	0	3	3	2
P1	3	2	2	2	0	0			
P2	9	0	2	3	0	2			
P3	2	2	2	2	1	1			
P4	4	3	3	0	0	2			

(b) List and explain the characteristics of various I/O devices? (4)

14.(a) Describe Paging technique and how it avoids External Fragmentation? (5)
(b) Explain RAID Structure? (5)

15 (a) Explain the Reader-Writer problem of Synchronization and Semaphore solution for it? (5)
(b) Discuss various Directory Structures with suitable examples (5)

16. (a) Explain different Program Threats? (4)
(b) Describe how Firewall can be used to protect system and network. (6)

17. Write short notes on
(a) Virtual Memory (5)
(b) Inverted Paging (5)

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Code No. 2598/CBCS

FACULTY OF ENGINEERING

B.E. (Civil) (CBCS) V – Semester (Main & Backlog) Examination,

December 2019

Subject: Theory of Structures - I

Time: 3 hours **Max. Marks: 70**

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

PART – A (20 Marks)

1. Define Relative Stiffness and carryover factor.
2. Write the slope deflection equation for a prismatic beam of flexural rigidity 'EI' and span 'I' if its Right end sinks down by 'Δ'.
3. What is rotational moment and rotational factor?
4. Find the displacement factor for the columns of frame shown in fig.(1).

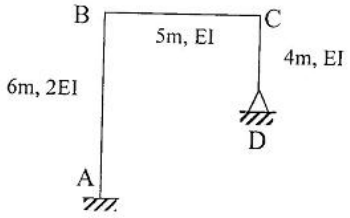


Fig.1

5. Using Unit load method find the rotation of free end of a cantilever beam of span 4m subjected to udl of intensity 10 kN/m over entire span.
6. Explain Lack of Fit problem in trusses.
7. State and explain Castigalino's theorems.
8. What is Eddy's theorem?
9. Show that the Bending moment of any section of a parabolic arch loaded with udl over entire span is Zero.
10. A three hinge semi-circular arch of radius 20m is loaded with concentrated load of 40 kN at its crown. Find the Horizontal thrust at the support.

PART – B (50 Marks)

11. Using Slope Deflection Method analyse the beam shown in Fig.(2) if the support at 'B' sinks down by 150/EI. Draw BMD and SFD.

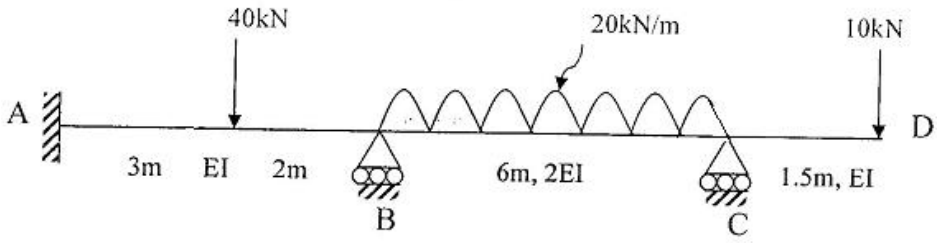


Fig.2

.....2

12. Analyze Frame shown in Fig.(3) by Moment Distribution Method and draw its SFD & BMD.

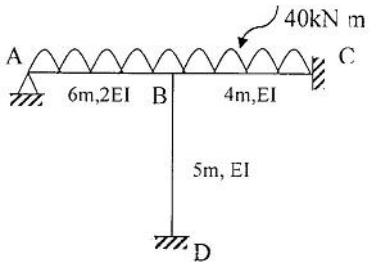


Fig.3

13. Analyse the beam shown in Fig.(4) by Kani's Method if the support at 'B' sinks down by 10 mm and that at 'C' sinks down by 7 mm. take EI as 6000 kN-m^2 and draw its SFD and BMD.

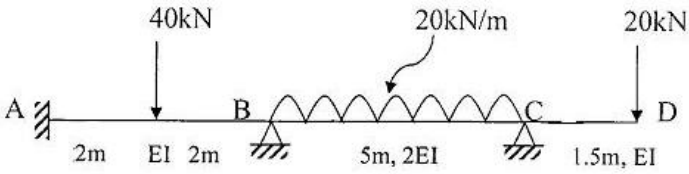


Fig.4

14. Analyse the frame shown in Fig.(5). By slope deflection method and draw its BMD.

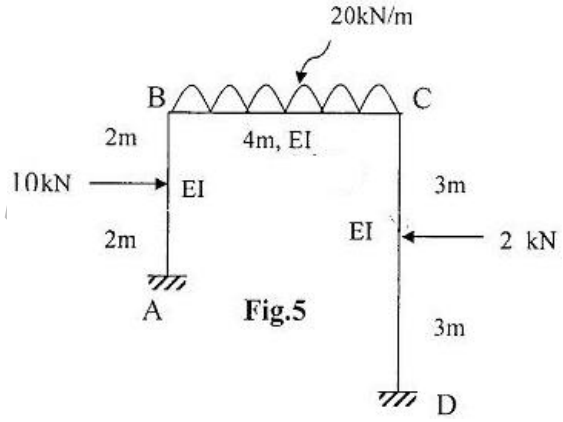


Fig.5

15. Using Strain Energy method find the vertical deflection at 'C' of qa warren truss shown in Fig.(6). Take L/AE as constant.

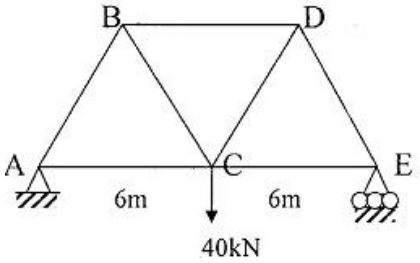
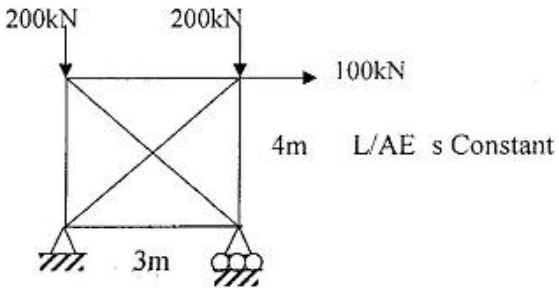


Fig.6

16. Find the forces in all the members of the truss shown in Fig.(7). Take AE as same for all members.

.....3

Fig.7



17. A parabolic arch of span 40 m central rise 5 m is loaded with an udl of 20 kN/m over its left half and a concentrated load of 25 kN at a distance of 12 m from right end. Find the Normal thrust and radial shear at a section 10 m from left end. Also draw the bending moment diagram for the arch.

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Code. No: 2609/CBCS

FACULTY OF ENGINEERING

B.E (EEE/Inst.) V-Semester (CBCS) (Main & Backlog) Examination, December 2019

Subject : Digital Signal Processing and Applications

Time: 3 Hours **Max. Marks: 70**

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

PART– A (10 x 2 = 20 Marks)

1. Find the linearity of the following system $y(n) = n^2 x(n)$. 2
2. Determine whether the following signal is periodic or non-periodic
   $x(n) = \sin\frac{2\pi n}{3} + \cos\frac{2\pi n}{5}$ 2
3. Prove the Time shifting property of DFT 2
4. Find the DTFT of the following signal x(n) = {1, -2, 2, 3} 2
5. How analog poles are mapped to digital poles in impulse invariant transformation? 2
6. What is Frequency warping in the designing of IIR filter? 2
7. Explain the advantages of windowing technique in FIR filter designing 2
8. Write the mathematical representation of up-sampler in multirate signal processing 2
9. Explain the Central Arithmetic Logic Unit (CALU) of TMS320C5X digital signal processor 2
10. Explain the concept of pipelining in digital signal processors. 2

PART– B (5 x 10 = 50 Marks)

11. a)Find the free response of the system described by the following difference equation $y(n) - \frac{5}{6}y(n-1) + \frac{1}{6}y(n-2) = x(n)$; with $y(-1) = 1$ and $y(-2) = 0$ 6

    b) Determine the even and odd components of the following signal x(n) = {5, 4, 3, 2, 1} 4

12. Obtain Radix-2, 8 – point DIF FET of the following signal x(n) = {1, 2, 3, 4, 4, 3, 2, 1} 10

13. a) Explain the steps of designing of Chebyshev IIR digital filter 5

    b) Determine the digital transfer function for the following analog transfer function using impulse invariant transformation for T=1 sec $H_a(s) = \frac{2}{(s+1)(s+3)}$ 5

14. a) Explain the Linear Phase Characteristics of FIR filter 5

    b) Explain the Down –sampling or decimation process with a factor of D. 5

15 a) Explain the different ON – chip peripherals of TMS320C5XDSP processor 5

    b) Explain the different elements of Central Processing unit of TMS320C5XDSP processor 5

…2

16. a) Find IDFT of the following sequence X(k) = {4, 2, 0, 4} 5

b) Find the inverse Z-transform of the following function using Long Division $X(z)=\frac{z^2+2z}{z^3-3z^2+4z+1}$;ROC$|z|>1$ 5

17. a) Obtain the Direct Form-II structure of the discrete time system described by the following difference equation

$$y(n)=-\frac{3}{8}y(n-1)+\frac{3}{32}y(n-2)+\frac{1}{64}y(n-3)+x(n)+3x(n-1)+2z(n-2)$$ 5

b) Explain the application of Digital Signal Processing to Speech Processing 5

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Code no: 2623/CBCS

FACULTY OF ENGINEERING

BE V Semester (CBCS) (ECE) (Main & Backlog) Examination, December 2019

Subject: Analog Communication

Time: 3 Hours **Max. Marks: 70**

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

PART – A (10 x 2 = 20 Marks)

1. Define modulation. Distinguish between continuous and pulse modulation schemes.
2. Write mathematical expressions for time domain representation of conventional AM, DSB-SC, SSB-SC and VSB signals.
3. Compare AM and FM based on transmission power, bandwidth, noise immunity.
4. Show how FM can be generated from a PM modulator and PM from a FM modulator with a diagram.
5. Distinguish between ideal, natural and flat-top sampled signals with waveforms.
6. Enlist the advantages of PPM over PAM and PWM.
7. Give the classification of transmitters.
8. Define sensitivity and fidelity of a receiver.
9. Define noise equivalent Temperature and Noise equivalent Band width.
10. Define noise bandwidth.

PART – B (5x10 = 50 Marks)

11. a) Discuss SSB-SC modulation and demodulation with necessary diagrams and mathematical analysis. (6)
    b) In single tone AM modulation, give the power content of every frequency component. (4)

12. a) Explain FM signal generation using Direct method. (5)
    b) An angle modulated signal is given by (5)
    $S(t) = 8 \cos[10^8 \pi t + 2 \sin 2\pi \times 10^3 t]$ is present across a 50Ω load, find
    i) Carrier power
    ii) Maximum frequency deviation
    iii) Modulation index
    iv) Transmission bandwidth
    v) Is it NBFM or WBFM signal?

13. a) Discuss the generation and detection of PWM signal with diagrams and waveforms. (5)
    b) State and prove sampling theorem for low pass signals. (5)

contd...2

14. a) What is heterodyning? Explain the working of a super heterodyne radio receiver with an emphasis on Automatic gain control. What are the typical values of Intermediate frequencies used in AM and FM systems. (7)

    b) If AM radio station at Hyderabad transmits at 870 KHz. What is its image frequency? The antenna of super heterodyne receiver is connected to the mixer via a tuned circuit whose loaded Q is 60. Find Image frequency rejection ratio (IFRR)? (3)

15. a) Derive the expressions for Figure Of Merit (FOM) in AM system. Find the FOM if modulation index is 0.7. (7)

    b) A mixer stage has a noise figure of 20dB and this stage is preceded by RF amplifier that has a noise figure of 9dB and an available power gain of 15dB. Calculate overall noise figure referred to the input. If the receiver is operated at room temperature of 27^0C, find equivalent Noise temperature of the cascaded stage. (3)

16. a) Describe AM signal generation with diagram and necessary mathematical analysis. (5)

    b) Show how Zero crossing detector performs FM demodulation. (5)

17. Write short note on :

    i) Pre and De-emphasis circuits (5)

    ii) Choice of Intermediate frequency (5)

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Code No. 2629/CBCS

FACULTY OF ENGINEERING

B. E. (Mech.) V – Sem. (CBCS)(Main &Backlog) Examination, December 2019

Subject: Manufacturing Processes

Time: 3 Hours **Max. Marks: 70**

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

PART – A (10x2=20 Marks)

1. State the requirements of riser.
2. Compare wood and metal as pattern material
3. What are advantages of die casting over sand moulding process?
4. What is cold shut and misrun? How do you avoid them?
5. "HAZ in solid state welding is less". What is HAZ? On what parameters HAZ depends on.
6. What are the applications of thermit welding?
7. Explain about Tresca yield criteria.
8. Briefly explain the principle applications of thermit welding.
9. Differentiate between blanking and punching operations.
10. What are the advantages and limitations of explosive forming process?

PART – B (10x5=50 Marks)

11. (a) Explain various properties of moulding sand and give-its ingredients.
    (b) Discuss the types of pattern allowances provided on patterns.

12. (a) With neat sketches discuss the process of blow moulding of plastic components. How does this process differ from extrusion of plastics?
    (b) Explain with the help of neat sketches how ultrasonic welding takes place. What are the varies applications?

13. (a) Enumerate the advantages and limitations of PAW process. Give advantages and applications.
    (b) With suitable diagram discuss the working principle, applications and limitations of laser beam welding.

14. (a) Explain the principle and applications of and projection welding.
    (b) Discuss the principle and applications of Electron Beam welding with aid of neat sketch.

15. (a) Define yielding. Derive the equation of angle of bite in rolling process.
    (b) Explain the Electro-magnetic forming process with aid of neat sketch and give its applications and limitations.

16. (a) Explain the principle and applications of rubber pad forming process.
    (b) Explain the process of shell moulding with aid of neat sketches.

17. Write short notes on any two of the following:
    (a) Forging operations
    (b) Lost wax process
    (c) GTAW welding
    (d) Tube drawing

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Code No. 2634/CBCS

FACULTY OF ENGINEERING

B. E. V Semester (CBCS) (Prod.) (Main & Backlog) Examination, December 2019

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	Explain the phenomenon of *plastic deformation*.	2
2	Distinguish between hot working and cold working.	2
3	Give a brief classification of presses used for sheet metal works.	2
4	Explain the blanking operation with a neat sketch.	2
5	How do you measure the *degree of drawing* in drawing operation?	2
6	State the advantages and limitations of extrusion process.	2
7	What is forging? Write the properties of forged components.	2
8	Enlist the common equipment used for forging operations.	2
9	Why folds occur during rolling process? Explain.	2
10	Sketch and label the parts of a three high rolling mills.	2

PART – B (5 x 10 = 50 Marks)

11. a) Discuss the effect of temperature and microstructure of metal in Metal Forming. 5
    b) Explain the yield criteria for a ductile material. 5

12. a) Explain the following sheet metal operations with neat sketches.
    i) Shearing ii) Bending and iii) Drawing. 5
    b) Explain the working of a combination die with help of a neat diagram. 5

13. a) Discuss the principle of deep drawing operation with a sketch. 5
    b) Explain the following terms with respect to drawing operations:
    i) drawing ratio ii) percentage reduction and iii) drawing force. 5

14. a) Describe the principle of forward extrusion process with a sketch. 5
    b) Explain the lubricating methods adopted for backward hot extrusion process. 5

15. a) Classify the forging processes. Discuss any one with the help of a neat sketch. 5
    b) Explain the spinning operation with the help of a neat sketch. 5

16. a) Distinguish clearly between Open die and Closed die forging process. 5
    b) Describe various forging defects and discuss the remedies for the same. 5

17. Write short notes on any TWO of the following: 2 X 5 =10
    a) Plane stress and plane strain conditions
    b) Homogeneous deformation
    c) Cluster Roll Mill.

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Code No. 2636/CBCS

FACULTY OF ENGINEERING

B. E. (Mech.) V – Sem. (CBCS)(Main &Backlog) Examination, December 2019

Subject: Automotive Diesel Engines

Time: 3 Hours **Max. Marks: 70**

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

PART – A (10x2=20 Marks)

1. Define cetane number and ignition quality.
2. What are the good qualities of fuel used in compression ignition engines?
3. What is PTFI?
4. Define maximum speed and all speed governor.
5. Explain why swiri movement is required in diesel engines during suction period?
6. What are the functions of combustion chamber?
7. Explain about turbo lag.
8. Draw a neat sketch of turbo charger.
9. What is the Bharat and euro norms of standard of pollution?
10. Draw the performance maps of diesel engine.

PART –B (10 x 5 = 50 Marks)

11. Sketch Dual cycle on P-V and T-S diagram and derive an equation for thermal efficiency of dual cycle and also write the equation for mean effective pressure.
12. Describe the construction and working of the jerk type fuel injection pump with a neat sketch.
13. Describe with suitable sketches, the various stages of combustion in a diesel engine.
14. Explain the working principle of super charging and turbo charging with suitable neat sketches.
15. What are the different methods to analyse the exhaust gasses and explain each of them?
16. What are the methods used for calibrating fuel injection pump? Explain in detail.
17. What is the data required for drawing heat balance sheet? Explain with suitable examples.

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Code NO.2640/CBCS

FACULTY OF ENGINEERING

B.E. V-Semester (CBCS)(CSE)(Main & Backlog) Examination, December 2019

Subject : Data Communications

Time : 3 Hours **Max. Marks : 70**

Note : Answer all questions from Part A and any Five questions from Part B

PART – A (20 Marks)

1	What functions are performed by Bridge?	2
2	Compare Guided and Unguided Media.	2
3	What are the different types of Noises?	2
4	Define three types of HDLC stations.	2
5	Define Bit stuffing.	2
6	Distinguish between Synchronous and Asynchronous transmission.	2
7	What are the different services provided by ATM?	2
8	Distinguish Bridge and Router.	2
9	List some basic functions performed at MAC layer.	2
10	Define Single bit errors and burst errors.	2

PART – B (5X10 = 50 Marks)

11	a)	Explain Transmission Impairments.	6
	b)	Describe 2G of CDMA. ‘	4
12.		Discuss Flow control mechanism with neat diagram.	10
13	a)	Explain in detail about ATM Protocol Architecture.	6
	b)	Explain CRC with an example.	4
14	a)	Explain any two Collision free LAN Protocols.	6
	b)	Distinguish between Layer 2 and Layer 3 Switches.	4
15	a)	Describe cellular wireless networks of 3G systems	.6
	b)	How Medium Access Control is done in Wireless LAN’s?	4
16	a)	Explain in detail error Control Mechanism in Datalink layer.	6
	b)	Explain the concept of Parity check and CRC in error detection.	4
17	a)	Explain the functioning of ARP and RARP protocols.	6
	b)	List the merits of Digital transmission over Analog transmission.	4

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Code No: 2649 / CBCS

FACULTY OF ENGINEERING

B.E. V Semester (CBCS) – IT (Main & Backlog) Examination, December 2019

Subject: DATABASE SYSTEMS

Time: 3 Hours **Max. Marks 70**

Note: Answer ALL questions from PART-A & any five questions from PART-B

Part-A (10 x 2 = 20 Marks)

1 Differentiate traditional File Systems Vs Database Systems.
2 Draw the E-R diagram for library application.
3 Write about Database Languages with syntax and example.
4 Write about Relational Algebra Operations.
5 Explain various Integrity Constraints with example.
6 Write short notes on Embedded SQL.
7 What is a Transaction? Explain various states of a Transaction.
8 Write about Storage structure.
9 Differentiate Static Hashing and Dynamic Hashing.
10 Explain ACID properties.

PART – B (5 x 10 = 50 MARKS)

11 Explain about DBMS architecture with diagram in detail. 10

12 a. Explain different types of **JOINS** with example. 5
b. Write the SQL queries for the following. (consider EMP table as default) 5
i. Find the details of employees who names starts with a letter '**S**'
ii. Display THREE characters from the 5th Position of the string "**UNIVERSITY**"
iii. Find those Employees whose manager also works in the **same dept**.
iv. Find the no. of employees who works in department '**SALES**'
v. Find the jobs along with total salary for each job where total salary is **more than 5000**.

13 Explain various **Normal Forms** with example. 10

14 a. Write a PL/SQL code for a Package comprising of a FUNCTION for Armstrong number and a PROCEDURE for sum of digits. 5
b. Explain Log Based Recovery. 5

15. a. Explain the concept of "Conflict Serializability" with an example. 4
b. Construct B+ tree for the following set of values (with n=4, as pointer value) 6
1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42

16. a. Discuss about Time-stamp based protocol. 5
b. Explain the concept of 2-Phase locking protocol. 5

17. Write short notes on the following. 10
a. Write about various Database Designs / Models.
b. What is a Deadlock? And explain how Deadlock Handling can be done.
c. Advanced Recovery Techniques.

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