FACULTY OF ENGINEERING
BE V-Semester (CE) (AICTE) (Main) Examination, July 2021

Subject: Hydraulic Engineering

Time: 2 Hours   Max .Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1   How would you distinguish between hydro dynamically smooth & rough boundaries?
2   List out the components of centrifugal pump.
3   What is meant by critical velocity of flow in an open channel?
4   Explain the term dimensionally homogeneous equation.
5   Define the various types of flows in an open channel.
6   Derive chezy's formula for uniform flow through a channel.
7   Explain the terms: Wetted Perimeter and Hydraulic mean depth.
8   A trapezoidal channel has a bottom width of 6 m and side slopes of 2 horizontal to 1 vertical. If the depth of flow is 1.2 m at a discharge of 10 m³/s, compute the specific energy and critical depth.
9   Give in detail the classification of turbines.
10 What do you understand by the terms: Major energy loss and Minor energy losses in pipes?

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11 (a)   Derive Hagen Poiseuille's equation for laminar flow through circular pipes. And also sketch the velocity distribution and shear distribution across a section of the pipe.
   (b)   A pipe 200mm in diameter and 45m long conveys water at a velocity of 2.5 m/s. Find the head loss in friction. Take f= 0.006.

12 (a)   What do you understand by most economical channel section? Derive the condition for the rectangular channel of best section. Show that hydraulic mean depth is one-half the depth of flow.
   (b)   A channel of trapezoidal section has sides sloping at 60° with the Horizontal and a bed slope of 1 in 800 and conveys a discharge of 12 m³/s. Find the bottom width and depth of flow for most economical section. Take Chezy's Constant C=70.

13 (a)   Explain specific energy curve diagram and determine the expression for critical Depth and critical velocity.
   (b)   A 3.6 m wide rectangular channel conveys 9.0 m/s of water with a velocity of 6 m/s.
          (i) Is there a condition for hydraulic jump to occur? If so, calculate the height, length and strength of the jump. (ii) What is loss of energy per kg of water?

14 (a)   Distinguish between Raleigh's method and Buckingham's π – Theorem method.
   (b)   A ship modal 1m long with negligible friction is tested in a towing tank at a speed of 60 cm/s. To what ship velocity does this correspond if the ship is 60 m long? A force of 4.9 N is required to tow the modal. What propulsive force does this represent in the prototype?

15 (a) Explain the characteristic curves of turbines.
   (b) A centrifugal pump delivers water against a net head of 14.5m at the design speed
        of 1100 rpm. The vanes are curved backwards at an angle of 30^0 with the periphery. The
        impeller diameter is 30cm and outer width 5cm. Determine discharge of the pump. Take
        manometric efficiency as 95%.

16 (a) Define a centrifugal pump. Describe the functioning of a centrifugal pump
        with a neat sketch.
   (b) Water flows at 12.5 m/s in a channel 2 m wide, at a velocity of 1.25 m/s. Calculate the specific
        energy head. Find also the critical depth, critical velocity and minimum value of specific
        energy head corresponding to this discharge in the channel.

17 (a) Derive Darcy- Weisbach equation.
   (b) Briefly explain about the working of impulse turbine with a neat sketch.

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FACULTY OF ENGINEERING
BE V-Semester (EEE) (AICTE) (Main) Examination, July 2021

Subject: Power Systems-I

Time: 2 Hours   **Max .Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 Define (i) Load Factor (ii) Diversity factor
2 List the advantages of ring-main system.
3 What is surge tank and explain its importance in a Hydro-Electric Power Plant.
4 Explain the operation of Economizer in a Thermal Power Plant.
5 What is the function of Control rods in fission reaction and give the examples.
6 Write the differences between wind turbines and wind mills.
7 What is the need of grading the cables?
8 List the various parts of Cables.
9 What you understand by GMR and GMD of a transmission line?
10 List out the advantages of bundled conductors.

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11 (a) Explain different types of tariffs.
    (b) Define Mass curve and explain its importance.

12 Explain the various parts of Steam Power Station with neat sketch.

13 (a) Compare Thermal and Fast Breeder Reactors.
    (b) What considerations have to kept in view in siting Nuclear Power Plant?

14 (a) Derive and expression for most economical conductor size in a cable.
    (b) Discuss different types of insulators.

15 (a) A 3-phase, 50Hz, 66 KV Over Head Transmission Line conductors are placed in a horizontal plane as shown below. The conductor diameter is 1.25cm. if the line is 100km, Then Calculate (i) Capacitance per phase (ii) The charging current per phase assuming complete transposition of the line.
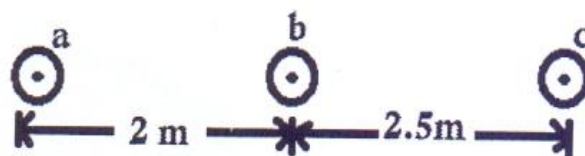
    (b) Consider a Double circuit 3-phase overhead line phase sequence is ABC is completely transposed. Conductor radius is 1.3cm. Find the inductance per phase per Km.
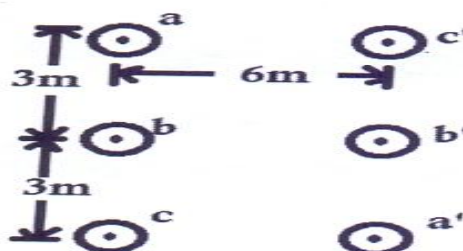
16 (a) Discuss the various methods of power factor improvement.
   (b) Explain the working of nuclear power station with a neat Block diagram?

17 (a) What are the characteristics of Wind Power?
   (b) Derive the expression for sag of a line supported between two supports of the same height.
   (c) Transposition of Transmission lines

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FACULTY OF ENGINEERING

B.E. V – Semester (AICTE) (EIE) (Main) Examination, July 2021

Subject: Power Plant Instrumentation

Time: 2 Hours   **Max.Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 What is the necessity of condenser in TPP?
2 Based on what you know explain about steam circuit.
3 Write a short note on metal temperature measurement in boiler.
4 Explain about pedestal vibration.
5 What is the significance of air-fuel ratio?
6 Explain about different types of super heater used in TPP.
7 What is the function of lubricating oil?
8 How to predict the outcome of bypass damper super heater?
9 Sketch the diagram of hydroelectric power plan.
10 What is function of control rods in NPP?

PART – B

Answer any four questions   **(4x15=60 Marks)**

11   With a neat diagram explain the piping and instrumentation diagram of boiler. Indicate all control loops that can be established without redundancy.

12 a) With a neat diagram explain about flame monitoring system.
   b) Explain in detail about piping system used for pressure measuring system..

13 a) With a relevant process diagram explain the three element drum level control of boiler in power plant.
   b) With a neat diagram explain about furnace draft controller.

14   What is the main purpose of heat exchanger? Draw the schematic diagram and explain about the construction and working of hydrogen generator cooling system.
15   With a schematic diagram explain in detail about the construction and working principle of solar power plant.

16 a) Describe about the treatment of flue gases with relevant diagram.
   b) Explain in detail about turbine following mode operation.

17 Write short note on:
   a) Condenser vacuum controller.
   b) Wind energy power plant.

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FACULTY OF ENGINEERING

B.E. V – Semester (ECE) (AICTE) (Main) Examination, July 2021

Subject: Digital Signal Processing

Time: 2 Hours   **Max.Marks: 70**

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 What is bit reversal in FFT?
2 Explain time shift property of DFT?
3 What are the properties of chebychev filters?
4 Differentiate between impulse invariant and bilinear transformation techniques of deigning digital filter?
5 Compare hamming and Blackman windows?
6 What are the key features of FIR filters?
7 What is interpolation? When it is performed?
8 Write about sub band coding of speech signals?
9 Differentiate between RISC and CISC CPU?
10 What is MAC operation in DSP processor?

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11   Compute the 8 point DFT of the sequence
       $x(n)=\{2-1,1,0,3,0,3,0,1,1\}$ using DIF-FFT algorithm?

12   Design a chebychev IIR-LPF using impulse invariant technique for the following specifications:

       $H(e^{jw})=3dB$ $0 \leq w \leq \pi/3$

       $=15dB$ $3\pi/5 \leq w \leq \pi$

    With sampling time T=1 sec

13   Design an ideal LPF whose desired frequency response is

       $H(e^{jw})=1$ $0 \leq w \leq \pi/5$
       $=0$ otherwise using Hamming window for N=7.

14 a) Explain the decimation process. How it is different from interpolation?
    b) Write three applications of multi rate signal processing?

15   Discuss architecture and instruction set of TMS 320C54 xx processor?

16 a) Find circular convolution of the sequences $x(n)=\{1,0,1,0\}$ and $y(n)=\{2,-1,0,1\}$?
    b) Compare overlap add and overlap save methods of convolution?

17 a) Explain Gibbs phenomenon?
    b) Explain how sampling rate by an rational factor is achieved?

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FACULTY OF ENGINEERING
BE V-Semester (M/P) (AICTE) (Main) Examination, July 2021

Subject: Design of Machine Elements

Time: 2 Hours   Max .Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1. Define: i) Brittleness ii) Toughness.
2. What are the methods of reducing stress concentration?
3. Differentiate between a code and a standard.
4. Define fatigue failure.
5. Draw the sketches of different types of welded joints.
6. Draw and name the different types of keys.
7. The boring bar of boring machine is 25mm. in diameter. If the angle of twist is 0.01 radian when subjected to a shear stress of 45 Mpa. Find the length of bar. Take $G = 0.84 \times 10^5$MPa.
8. What is cotter? Where are cotter joints used?
9. Differentiate between a differential screw and a compound screw.
10. What is a riveted joint? What will be diameter of a rivet which is required to make a lap joint of two plates 10 mm. thick?

PART-B

Answer any four questions.   **(4x15=60 Marks)**

11 (a) Describe the steps involved in designing a machine element with the help of a flow chart.

(b) A bolt in a flange coupling is subjected to a tensile load of 16kN due to initial tightening of the nut, and a shear load of 12kN due to power transmission. Suggest suitable size for the bolt according to various theories of failure. Yield strength in tension is 360 Mpa. Factor of safety is 3. Poisson's ratio is 0.25.

12 (a) Explain Miner's principle of cumulative fatigue.

(b) A cantilever rod of circular section is subjected to a cyclic transverse load -100N to +300N as shown in the diagram. Determine the diameter of the rod by i) Goodman's method and ii) Soderberg's method using the following data:
Factor of safety = 2
Theoritical stress concentration factor = 1.4
Notch sensitivity factor = 0.9
Ultimate strength = 550 MPa.
Yield strength = 320 Mpa.
Endurance limit = 275 Mpa
Size correction factor = 0.85
Surface correction factor = 0.90
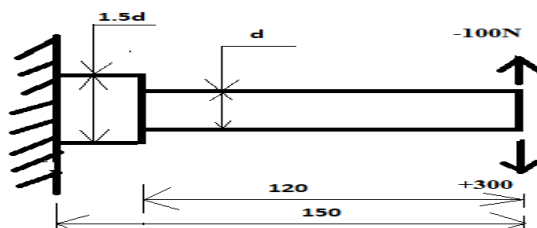
13 (a) A shaft transmitting 100kW power is running at 180 rpm, satisfying the following conditions. Determine the size of the size of the shaft:
   i.   Shear stress should not exceed 50 MPa.
   ii.   Angle of twist should not be more than 1^0 on a length of 16 times the diameter.
   Take G= 0.84 x 10^5 MPa.
   (b) Draw the diagram of a rigid flange coupling with and write the design procedure with the relevant formulae.

14 (a) Design and draw a knuckle joint to withstand a load of 100kN. All parts of joint are made of same material with $\sigma_{ut}=\sigma_{uc}$=480 MPa and τ_u=360 MPa. Use factor of safety of 6 on ultimate strength.
   (b)   Explain what is caulking and fullering with diagram.

15 (a) Determine the size of weld for eccentrically loaded member shown in diagram the permissible normal stress for the weld material is 75MPa.
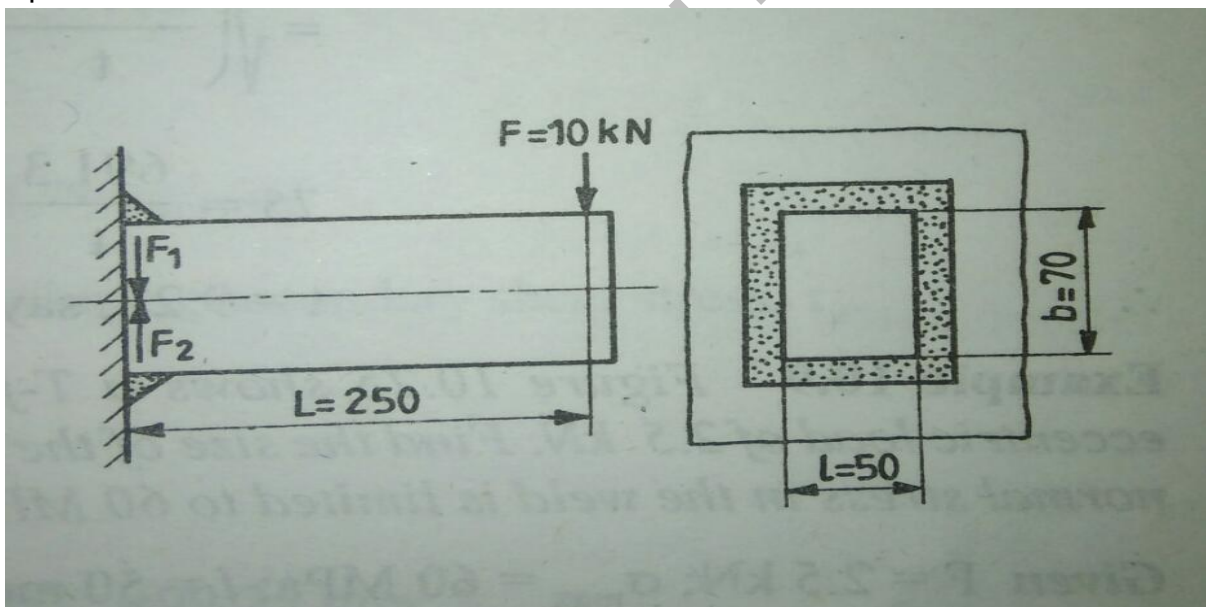
   (b) List out the advantages of welded joints over riveted joints.

16 (a)   Two plates of 15mm thick are connected by a double riveted lap joint with zig-zag riveting. Assume σ_t=80 MPa, σ_c=120 MPa and τ=60 MPa for both rivets and plates. Determine the efficiency of the joint.
   (b)   Write briefly about the modes of failure of riveted joints.

17 (a) The inner diameter of a cylindrical pressure vessel is 500mm and is subjected to an internal pressure of 2 N/mm^2 . the cylinder cover is fixed to cylinder body by means of 16 bolts of M 20 size. Each bolt is initially tightened with a preload of 20kN. The yield strength of bolt material is 320 MPa. Soft packing with thorough bolts is used for fixing the cover to cylinder. Determine the factor of safety for the bolts.
   (b) Write briefly about the locking devices for nuts.

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FACULTY OF ENGINEERING
BE V-Semester (AE) (AICTE) (Main) Examination, July 2021

Subject: Automotive Transmission

Time: 2 Hours   Max .Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1   What is the necessity of providing clutch free pedal play?
2   Differentiate wet and dry friction clutches.
3   What ate the advantages of using a spur gear in automotive gear box?
4   What are the requirements of automotive transmission system?
5   Define Torque Capacity.
6   What you mean by coupling point in Converter coupling?
7   How reversing is achieved in planetary gear box?
8   What are the advantages of over drive?
9   What is function of swash plate in hydrostatic pump?
10 What are the merits and demerits of electrical drives?

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11 (a) Explain different method Clutch actuation with help of block diagram.
    (b) Write note on clutch trouble shooting diagnosis.

12 Explain with help of neat sketch synchromesh gear box.

13 (a) What is the torque converter? In what respect is it different from a fluid flywheel?
    (b) What are different ways to reduce drag torque in fluid coupling?

14 (a) List out the main components of Automatic Transmission System.
    (b) What are the advantages and disadvantages of CVT?

15 (a) Explain control mechanisms of electric transmission system?
    (b) Differentiate clearly between a hydrodynamic and hydrostatic drive.

16   Explain various types of hydrostatic system.

17   Write short notes on:
    (a) Transaxle.
    (b) Valve Body.

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FACULTY OF ENGINEERING
B.E. V – Semester (CSE) (AICTE) (Main) Examination, July 2021

Subject: Operating Systems

Time: 2 Hours   Max.Marks: 70
Note: Missing data, if any, may be suitably assumed
PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 Draw a neat diagram of PCB?
2 Draw the process state transition diagram?
3 State the necessary conditions for the deadlock to occur?
4 What is resource allocation graph? Give example.
5 What is critical section problem?
6 Differentiate between internal and external fragmentation?
7 What is thrashing? Give the reasons of thrashing.
8 What is file mounting?
9 Define seek time and rotational latency?
10 Draw a neat diagram for the levels of RAID?

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11 a) What is a system call? Explain types system calls?
   b) Explain the different multithreading models?

12   Compute for each average turnaround time and average waiting time using FCFS, SJF,
       Priority (non-preemptive), round robin (Time slice=2ms). Process scheduling method. Draw
       the Gantt chart for each scheduling algorithm.

Process	Burst time	Priority	Arrival time
P1	10	3	0
P2	3	2	2
P3	1	1 (H)	1
P4	5	4 (L)	1
P5	7	2	1

13 a) Explain the paging technique with a suitable example?
   b) Discuss about various file allocation methods.

14   Consider the following page-reference string
          7,0,2,1,3,4,2,1,0,2,1,4,3,2,1,0,0,1,2,1
       Calculate the number of page fault that would occur for the following algorithms assuming
       frame size as 3.
          1. FIFO 2. OPTIMAL 3. LRU 4. MRU 5.LFU 6. MFU

15 a) What is dining-philosophers problem? Describe the solution of dining philosopher's problem
       using monitors.
   b) Write the bankers algorithm for deadlock avoidance.

16 a) Consider disk queue with I/O requests for the blocks on cylinders:
       95, 181, 39,123,12,124,65,68 and the disk head is initially at 57. Compute the total number
       of head movement according to SSTF, SCAN, LOOK disk scheduling algorithm.
   b) What is virtual memory? Explain about demand paging?

17 Write short notes on any two of the following:
   a) Monitors
   b) Semaphores
   c) Free space allocation techniques

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FACULTY OF ENGINEERING
B.E. V – Semester (IT) (AICTE) (Main) Examination, July 2021

Subject: Operating systems

Time: 2 Hours   **Max.Marks: 70**

Note: Missing data, if any, may be suitably assumed
PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 Distinguish between system program & system calls.
2 What is process control block?
3 Define two models of interprocess communication.
4 What is base register and limit register.
5 Define thrashing and how it is caused.
6 What do you mean by boot control block and volume control block?
7 Define seek time and transfer time.
8 What is demand paging?
9 Differentiate between C-SCAN and C-LOOK disk scheduling algorithms.
10 Define multitasking and multiprogramming.

PART – B

Answer any four questions   **(4x15=60 Marks)**

11 a) List the advantages of designing an operating system.
   b) Describe different threading issues?

12 a) Explain Critical-section problem with an example.
   b) Discuss the methods for handling deadlocks?

13 a) Illustrate file mounting and cascade mounts?
   b) Explain memory management with paging. Discuss any two techniques for structuring of page table.

14 a) Describe the working of an I/O system.
   b) Write short notes on RAID structure.

15 a) Explain how cryptography is used as a security tool.
   b) Discuss the various aspects of protection and security.

16   Consider the following set of processes, with the length of the CPU burst given in milliseconds.

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The process are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.
 i) Draw four Gantt charts that illustrate the execution of these proves using the following scheduling algorithms: FCFS, SJF, non-pre-emptive priority (a smaller priority number implies a higher priority) and RR (quantum=1).
ii) What is the turn around and waiting time of each process for each of the scheduling algorithm.

17 a) Explain the readers-writer problem of synchronization and explain the semaphore solution for it.
   b) How can working set model facilitate in controlling thrashing?

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FACULTY OF ENGINEERING
BE V-Semester (CE) (CBCS) (Backlog) Examination, July 2021

Subject: Theory of Structures-I

Time: 2 Hours   **Max .Marks: 70**

### Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 Explain rotation factor and displacement factor.
2 Write down the conditions for sway in portal frames.
3 Find the end moment of propped cantilever beam which is subjected to UDL throughout the span. Use slope deflection method.
4 State the II theorem of castigialino. What are its uses?
5 Write down the three straining action of an arch.
6 Mention the disadvantages of slope deflection method.
7 List out the importance of kinematic indeterminacy.
8 Write down uses of Eddy's theorem.
9 Discuss the lack of fit in a statically indeterminate truss.
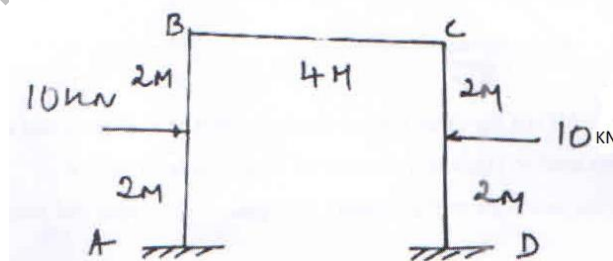10 Write horizontal shear equilibrium equation in a rigid portal frame.

PART – B

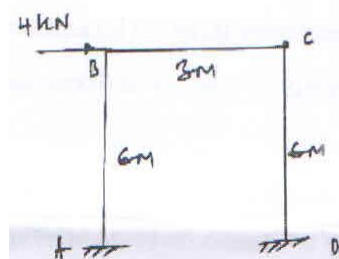**Answer any four questions.**   **(4x15=60 Marks)**

11 Analyze the given continuous beam by moment distribution method.
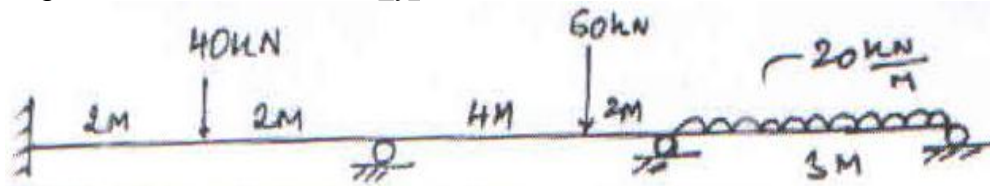
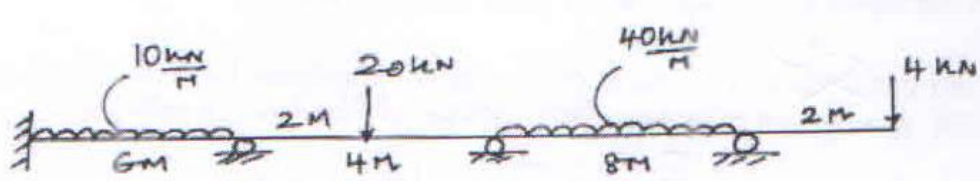12 Draw BMD for the given portal frame by using Kani's method of analysis.

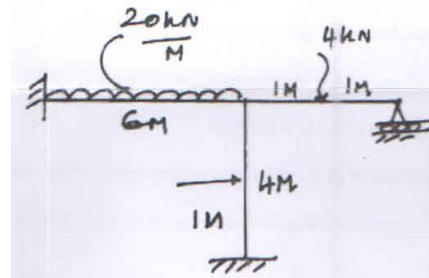13 Analyze the given portal frame and draw BMD using moment distribution method.
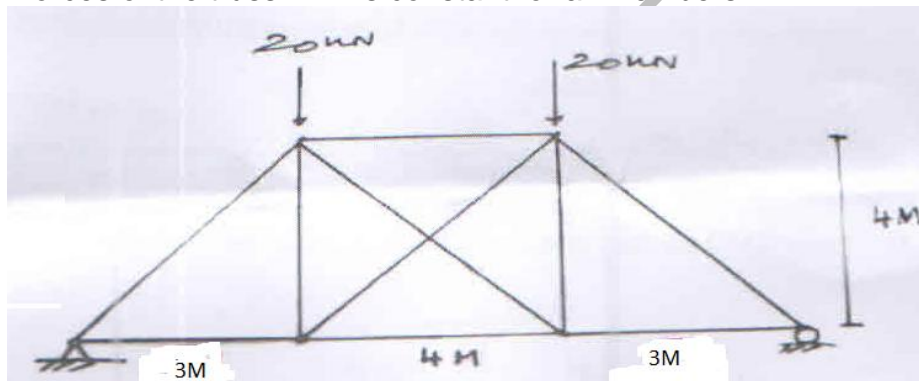
14 Draw SFD and BMD of the given continuous beam using Kani's method.

15 Draw SFD and BMD of the given simple frame using slope deflection method.

16 Find member forces of the truss. AE is constant for all members.

17 Draw BMD of the three hinged parabolic arch of span 50m and rise 8m carries a point load of 80kN at a distance of 10m from left support. Find the reactions at the support. Compute radial shear and normal thrust at a distance of 3m from left support.

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FACULTY OF ENGINEERING

B. E. V– Semester (CBCS)(EEE/Inst.)(Backlog) Examination, July 2021

Subject: Digital Signal Processing & Applications

Time: 2 hours   Max. Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5 x 2 = 10 Marks)**

1. Determine the system function order of the following difference equation.

$$y(n)-\frac{1}{8}y(n-1)+\frac{5}{9}y(n-2)=x(n)-\frac{1}{5}x(n-1)$$

2. What is signal Sampling and Quantization?

3. Find the DTFT of the following signal x(n)=[9,-4,3,5].

4. List the properties of DFT.

5. What is warping effect and how it can be overcome?

6. If H(s)=1/S(s+1), find H(z) using impulse invariant method.

7. Compare FIR and IIR filters.

8. What is meant by Multirate signal processing?

9. Explain the process of Pipelining in Digital Signal Processor.

10. List the applications of Digital Signal Processor.

PART – B

Answer any four questions.   **(4 x 15 = 60 Marks)**

11. a) Define the following systems Linear, Time Invariant, FIR and Causal.
    b) Determine the output response y(n) if input is x(n)={6,-2,1,7}and impulse
       response of h(n)={1,1,1,1}by using
       i) Linear Convolution ii) Circular Convolution.

12. Find 8-point DFT of the sequence x(n)={6,-2,5,1,2,9,8,3} by Radix-2 DIF FFT.

13. Design a Butter worth digital IIR Lowpass filter using Impulse Invariance method to satisfy the following conditions.

    $0.8\leq$ | H(ω) | ≤ 1 for $0\leq\omega\leq0.2\pi$,

    | H (ω) | ≤0.2 for $0.6\ \pi\leq\omega\leq\pi$

14. Design a linear FIR Low pass filter using rectangular window by taking 7 samples of window sequence and with cut off frequency of ω_c=0.2π rad/sec.

.. 2

15. Explain the architecture of TMS320C5X floating point Digital Signal Processor with neat diagram.

16. a) Write short notes on Speech recognition and Speech Synthesis.
    b) Write the steps to design an IIR Chebyshev filter.

17. Obtain Direct form I and Direct form II structures of the given system.

$$H(z)= \frac{(1+z^{-1})(1+3z^{-1})}{1+0.5z^{-1})(1-0.25z^{-1})(1+0.125z^{-1})}$$

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FACULTY OF ENGINEERING

B.E. (ECE) V – Semester (CBCS) (Backlog) Examination, July 2021

Subject: Analog Communication

Time: 2 hours **Max. Marks: 70**

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions. **(5x2 = 10 Marks)**

1. A transmitter radiates 9 kW without modulation and 10.125 kW after modulation. Determine depth of modulation.
2. Write the properties of Hilbert transform.
3. Differentiate between narrow band and wide band FM signals.
4. State Carson's rule of FM bandwidth?
5. Define sensitivity and selectivity in radio receivers.
6. List out the advantages and disadvantages of TRF receiver.
7. What are the various sources of noise?
8. Define noise figure.
9. Differentiate between natural sampling and flat-top sampling.
10. How is PDM wave converted into PPM system?

PART – B

Answer any four questions. **(4x15 = 60 Marks)**

11. (a) Describe vestigial sideband transmission.
    (b) The total powers content of an AM wave is 600W. Determine the percent modulation of signal, if each of the side band contains 75W.

12. (a) What will happen if a PM signal is received by an FM receiver and vice versa? Also describe the narrowband frequency modulation.
    (b) In an FM system, a 7 KHz modulation (or base band) signal modulates 107.6 MHz. Find Carrier swing in the FM signal and modulating index m_f.

13. (a) State and prove the Sampling theorem for the Low pass signals.
    (b) What is pulse width modulation? How is it demodulated?

14. (a) Explain, how the constant intermediate frequency is achieved in the superhetrodyne receiver?
    (b) Explain the following with respect to Radio Receiver.
    (i) Mixer (ii) Sensitivity (iii) Selectivity (iv) AGC

15. (a) Explain the concept of Noise temperature. How it is related to Noise Figure?
    (b) Calculate the system noise of a receiver that has three stages of a receiver having overall gain of 40dB and bandwidth of 30 KHz. The noise figures is7dB. Assume To = 290^0 K and Boltzmann's constant 1.38×10^{-23} J/^{o}K.

16. (a) What is a product demodulator, where is it used, explain its principal of working.
    (b) Explain the principles of time-division multiplexing, with a sketch to show how the interleaving of channels takes place?

17. (a) Discuss the following terms with reference to receiver:
    (i) image frequency (ii) double spotting
    (b) Discuss addition of noise due to several amplifiers connected in cascade.

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FACULTY OF ENGINEERING

B.E. V Semester (CBCS) (Mech) (Backlog) Examination, July   2021

Subject: Manufacturing Processes

Time : 2 Hours   **Max. Marks: 70**

Missing data, if any, may be suitably assumed

PART – A

Note: Answer any Five Questions   **(5x2= 10 Marks)**

1. How pattern differs from casting? Explain briefly.
2. State the functions of riser. Suggest correct location of riser.
3. Differentiate between sand casting and die casting.
4. Mention the applications of plastic extrusion process.
5. Give a brief description of gas welding equipment.
6. How the arc-welding electrodes are classified? Explain briefly.
7. Briefly explain the concept of Forge welding.
8. Mention the factors affecting weldability of Cast iron.
9. What do you understand by *yield criteria*? Explain.
10. Differentiate between direct and indirect extrusion process.

PART – B

Note: Answer any Four Questions   **(4x15= 60Marks)**

11. a) Discuss about various types of moulding sands used in foundry.
    b) What is a chill? Explain its role in achieving directional solidification.

12. a) Explain the Shell moulding process with a neat sketch.
    b) Describe hot chamber die casting process with help of a neat sketch.

13. a) Explain principle of Submerged arc welding with neat diagram.
    b) Differentiate between GMAW and GTAW.

14. a) Explain the principle of Friction Stir Welding Process with help of a neat diagram.
    b) Discuss the Principle of Projection Welding. Mention its advantages and applications.

15. a) Differentiate between blanking and piercing operations with neat diagram.
    b) Explain the Electro Magnetic Forming process with a neat sketch.

16. a) Explain the principle of investment casting. State its advantages and limitations.
    b) Describe the Rubber pad forming. Mention its applications.

17. Write short notes on the following:
    a) MEMS
    b) Gas Cutting

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FACULTY OF ENGINEERING

B.E.V – Semester (Prod) (CBCS) (Backlog) Examination, July 2021

Subject: Metal Forming Technology

Time: 2 Hours   Max.Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 Explain the reason for difference in theoretical and practical shear stress in deformation of metals.
2 State the advantages of cold working.
3 Give importance of Centre of pressure in sheet metal work?
4 Differentiate between blanking and piercing?
5 Differentiate between redrawing and reverse drawing.
6 List out defects in drawing process.
7 What is forge ability? Mention two forge ability tests?
8 Give expression for rolling process.
9 How is upsetting different from fullering in forging?
10 Name different types of furnaces used in forging.

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11 a) Distinguish between cold working and hot working with their merits and demerits.
   b) Explain the various empirical equations used to represent stress-strain curves for material and their limitations.

12 a) Explain design parameters in drawing process.
   b) An aluminum cup of 160 mm depth and 60 mm inside diameter to be deep drawing for a 6 mm thick sheet metal. Determine the blank size required neglecting the punch and die corner radii.

13 a) Explain hydrostatic extrusion and impact extrusion with neat sketches.
   b) Discuss the process of flow forming.

14 a) Draw neat sketches of cluster rolling mill and planetary rolling mill and mention their advantages.
   b) With neat sketch explain various types of roll mills.

15 a) Explain the design of the forging die for drop forging.
   b) Discuss any two types of hammers used in forging with neat sketches.

16 a) Give the classification of presses with their applications.
   b) Explain spinning process with a neat sketch.

17 Write shot notes on:
   a) Stretch forming
   b) Coining and Embossing
   c) Powder rolling and roll bending

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FACULTY OF ENGINEERING
B.E. V – Semester (CBCS) (AE) (Backlog) Examination, July 2021

Subject: Automotive Diesel Engines

Time: 2 Hours   Max.Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   **(5x2=10 Marks)**

1 Define the following:
     a) Compression ratio   b) Cetane number
2 Why diesel engine volumetric efficiency is more compare to petrol engine?
3 Differentiate between direct and indirect injection in diesel engine.
4 Define ignition lag.
5 What are the advantages of air cell combustion chamber?
6 Define the following:
     a) Swirl   b) Squish   c) Turbulence
7 Draw pressure-crank angle diagram of diesel engine.
8 What are the benefits of turbocharging over supercharging?
9 Explain how pneumatic governor works.
10 List out some of the emissions from diesel engine.

PART – B

Answer any four questions.   **(4x15=60 Marks)**

11 a) Derive an expression for mean effective pressure of ideal diesel cycle.
   b) Draw a schematic fuel feed pump and explains its working principle.

12   A four stroke engine working on a dual combustion cycle is supercharged by a turbocharger. Air from the atmosphere at 1 bar and 27°C is compressed isentropic ally to 1.6 bar. Both compressor and turbine have isentropic efficiency of 75%. The air is cooled to 37°C before entering the engine cylinder. The compression ratio of the engine is 18 and the peak pressure is not to exceed 125 bar. The total heat input is 1200 KJ/kg. The heat rejections is at constant volume. The exhaust gases, assumed to obey gas laws, are throttled to 1.6 bar before entering the turbine where they expand to atmospheric pressure. Neglecting all pressure and frictional losses, calculate the extra work available from the turbocharger. Assume steady flow process.

13 a) Explain the construction and working of four stroke diesel engine with a neat sketch.
   b) Describe the working of distributor type fuel injection pump.

14 a) Explain different stages of combustion in diesel engine.
   b) Explain M type combustion chamber with a neat sketch.

15 a) Explain the factors affecting the delay period in a CI engine.
   b) Briefly explain the phenomenon of knock in diesel engine.

16 a) Explain the different types of turbochargers and list their relative merits.
   b) Explain the following:
        1) Exhaust gas recirculation
        2) Charge cooling

17 a) Explain about the homogeneous charge compression ignition engine.
   b) What are bharath stage emission norms for diesel engines?

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FACULTY OF ENGINEERING
BE V-Semester (CSE) (CBCS) (Backlog) Examination, July 2021

Subject: Data Communications

Time: 2 Hours   Max .Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   (5x2=10 Marks)

1   Why is layered concept needed in Protocol Architecture?
2   Define Data Communication Model and Protocol Architecture.
3   What is meant by line configuration?
4   Define single bit errors and burst errors.
5   What is the need for AAL?
6   Enumerate different types of multiplexing techniques.
7   What is MAC Protocol? Where is it needed?
8   List some basic functions performed at the MAC layer.
9   Draw IEEE 802.11 MAC Frame format with details.
10 What is the principle of frequency reuse technique in context of a cellular Network?

PART – B

Answer any four questions.   (4x15=60 Marks)

11 (a) Explain about the functionalities and duties of each TCP/IP layer.
     (b) Differentiate QPSK from OQPSK.

12 (a) Explain CRC with an example.
     (b) Explain EIA-232 in respect of four important characteristics.

13 (a) Explain the concept of sliding window protocol.
     (b) Describe the ATM cell header format.

14 (a) Write about layer 2 and layer 3 switches.
     (b) Explain briefly about Gigabit Ethernet?

15 (a) Explain IEEE 802.11 Architecture and Services.
     (b) Explain Bluetooth architecture.

16 (a) Explain transmission impairments.
     (b) What is the need of PCM? Explain the concept of sliding window protocol.

17 Write notes on the following:
         (a) Principles of Cellular Networks.
         (b) CSMA/CD.

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FACULTY OF ENGINEERING
BE V-Semester (IT) (CBCS) (Backlog) Examination, July 2021

Subject: Database Systems

Time: 2 Hours   Max .Marks: 70

Note: Missing data, if any, may be suitably assumed

PART – A

Answer any five questions.   (5x2=10 Marks)

1   Define DBMS.
2   List and explain applications of a database.
3   Explain about selection and projection operations in relational algebra?
4   Define nested query.
5   What is functional dependency?
6   Define integrity constraint.
7   What is the purpose of indexing in databases?
8   What is meant by dynamic hashing?
9   Define check-point.
10 Write about weak levels of consistency.

PART – B

Answer any four questions.   (4x15=60 Marks)

11 Explain the components of database with the help of a diagram.

12 Explain about different types of joins in SQL with suitable examples.

13 Explain about embedded SQL and dynamic SQL in detail.

14 How to test whether a given transaction is conflict serializable or not? Explain the procedure with help of an example.

15 Explain about:
    (a) Remote backup systems
    (b) Time-stamp based protocols

16 Explain about:
    (a) ACID properties of transaction
    (b) Aggregate operators in SQL

17 Write short notes on:
    (a) Bitmap indices
    (b) DBA
    (c) Null values in SQL

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