

FACULTY OF ENGINEERING
B.E 3/4 (Civil) II-Semester (Backlog) Examination, October 2020

SUBJECT: STEEL STRUCTURES

Time : 2 Hours

Max. Marks: 75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 Explain about residual stresses.
- 2 What is effective throat thickness? Show it with neat sketch.
- 3 List any four types of tension members with sketches.
- 4 What is lug angle? Explain with diagram?
- 5 Differentiate between stiffened and unstiffened beam end connection.
- 6 Define section modulus, plastic modulus and shape factor using relevant formulae.
- 7 Why battens and laces are provided to built up columns?
- 8 What are the load combinations that are usually considered in the design of roof trusses?
- 9 Draw a neat sketch of a column gusseted base.
- 10 Show that for economical system, the cost of trusses is equal to cost of roof coverings plus twice the cost of purlins.

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 Design a lap joint to connect two steel plates 10mm and 12mm to carry an axial load of 300KN use M16 bolts of 4.6 grade and also calculate the efficiency of joint. Draw neat sketches showing plan and cross section of joint.
- 12 Design a double angle tension member connected on each side of 10mm thick gusseted plate to carry an axial factored load of load of 375KN. use M20 bolts of grade 4.6.
- 13 Design a laterally unsupported beam of span 5.6m subjected to a factored load 45KN/M. Assume the ends to be simply supported. Adopt Fe410 plates use limit state method.
- 14 Design a built up column consisting of two channels back to back and carry a factored load of 1000KN. Design suitable lacing. Effective column height is 5m. use Fe410 grade steel. Design by limit state method.
- 15 Design a slab base for a column ISHB 350 to carry a factored load of 1000KN. Assume the load is transferred to base plate by welded connection, the column end and base plate are not machined for bearing. Take Fe410 grade steel and M25 grade concrete. Use limit state method.
- 16 The trusses for a factory building are spaced @ 5m c/c and the purlins are spaced @ 2m c/c. The pitch of the truss is $\frac{1}{4}$ and span of roof is 12m. The vertical load from roof sheets is 200N/m^2 and wind load normal to roof is 1500 N/m^2 . Design and I section purlin.
- 17 Write short notes on the following
 - (a) Modes of failures in tension members
 - (b) Explain how limit state method differs from working stress method
 - (c) Theory of plastic design

FACULTY OF ENGINEERING
BE 3/4 (EEE) II-Semester (Backlog) Examination, October 2020

Subject: Electrical Machinery-III

Time: 2 Hours

Max. Marks: 75

PART – A

Note: Answer any seven questions. (7x3 = 21 Marks)

1. Give the formula to compute the distribution factor for the fundamental emf in a full pitch, uniformly distributed winding?
2. What is the chording angle to eliminate the 5th harmonic in the generated emf?
3. What is hunting in synchronous Motor?
4. Draw the phasor diagram for an alternator at Zero power factor lagging conditions?
5. Explain transient stability in synchronous motor?
6. What is hunting? How hunting is prevented in synchronous motor?
7. What are the applications of Hysteresis motor?
8. Draw the static torque-angle characteristic of a switched reluctance motor?
9. Write the applications of Linear Induction motor?
10. Why 1- ϕ Induction motor is not self starting?

PART – B

Note: Answer any three questions. (3x18 = 54 Marks)

- 11 (a) Derive the formulae for finding the breadth factor and coil span factor for the Fundamental component of induced e.m.f. and also find the Distribution factor for 36 slots, 4 pole single layer 3- phase winding?
 (b) Derive the e.m.f. equation of Alternator.
- 12 An 11kV, 1000 kVA, 3-phase, star connected alternator has a resistance of $2\Omega/\text{ph}$. The open circuit and full load zero p.f. characteristics are given below. Find the voltage regulation of the alternator for full load current at 0.8 p.f. lagging by Potier method?

Field current (A)	40	50	110	140	180
OCC line voltage(v)	5800	7000	12500	13750	15000
Line volts, zero p.f.	0	1500	8500	10500	12200

- 13 (a) Define Synchronizing Action and Synchronizing Power?
 (b) A 2MVA, 3- ϕ , 8-pole alternator is connected to 6000V, 50Hz bus bars and has a synchronous reactance of $4\Omega/\text{ph}$. Calculate the synchronizing power and synchronizing torque per mechanical degree of rotor displacement at no load. Assume normal excitation.
- 14 (a) Explain steady state stability limit and how it can be improved for synchronous machine?
 (b) Explain the principle and operation of Hysteresis motor and give its applications?
- 15 Explain the operation and characteristics of split phase IM and Shaded pole motor?
- 16 (a) Explain the operation of Switched Reluctance motor with neat diagram.
 (b) Discuss the Two Reactance Theory for salient pole machine.
- 17 Write Short notes on
 - (a) Armature Reaction
 - (b) V & Inverted V Curves
 - (c) Servo motor Characteristics

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) II-Semester (Backlog) Examination, October 2020

Subject : Process Control

Time : 2 hours

Max. Marks :75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 What is Gibb's phase rule?
- 2 Calculate the resistance for turbulent flow
- 3 Explain block diagram of an automatic controller
- 4 Identify control action for the controller represented as shown in figure.1

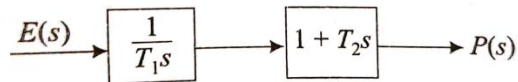


figure.1

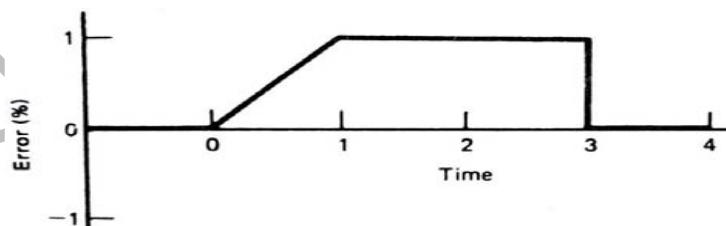
- 5 What is an offset?
- 6 Distinguish between P controller and PI controller.
- 7 Mention few electrical control elements
- 8 What are the different types of actuators?
- 9 Draw the ladder logic for NOR gate
- 10 What is the function of timer in PLC programming?

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 Explain clearly about non-interacting system and also find its transfer function.
- 12 a) Explain the pressure control system indicating all the elements of process control loop.
b) Explain in detail about two position controller.
- 13 A P+I controller has $K_P = 5$, $K_I = 1 \text{ sec}^{-1}$ and $P_i(0) = 20\%$. Plot the controller output for an error input as shown below.



- 14 Explain in detail about process reaction curve method.
- 15 a) Explain clearly about control valve characteristics with a necessary diagram
b) An equal percentage valve has a maximum flow of 50cm³/sec and a minimum of 2cm³/sec. If the full travel is 3cm, find the flow at a 1-cm opening
- 16 a) Explain basic structure of programmable logic controller
b) Explain PLC programming
- 17 Write short notes on
 - a) Dead time process
 - b) Hydraulic actuator
 - c) Discrete-state process control

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II – Semester (Backlog) Examination, October 2020

Subject: Digital Signal Processing

Time: 2 Hours

Max.Marks: 75

PART – A

Note: Answer any seven questions.**(7x3 = 21 Marks)**

- 1 How many multiplication and additions are required to compute N point DFT using radix 2 FET?
- 2 Find the IDFT of $Y(k) = (1, 0, 1, 0)$
- 3 What is prewarping? Why is it needed?
- 4 Distinguish between FIR and IIR Filters
- 5 What are the advantages of FIR filter?
- 6 Why Kaiser window is mostly used for designing FIR Filter?
- 7 Define sampling rate conversion
- 8 What is the use of anti imaging filter in interpolation?
- 9 List the basic characteristics of digital signal processor
- 10 Write any three application specific instructions of TMS 320C54 x processor.

PART – B

Note: Answer any three questions.**(3x18 = 54 Marks)**

- 11 a) Discuss the use of FFT algorithm in linear filtering.
b) $h(n) = 2n, n=0, 1, 2, 3$. Find DFT and sketch it.
- 12 a) Design a digital Chebyshev low pass filter satisfying the following specifications
 $0.707 \leq |H(e^{j\omega})| < 1, 0 \leq \omega \leq 0.2\pi$
 $|H(e^{j\omega})| \leq 0.1, 0.5 \leq \omega \leq \pi$ with $T = 1$ sec.
b) Convert the analog filter $H(s) = 0.5 (s+4) / (s+1) (s+2)$ using impulse invariant transformation with $T = 0.31416s$.
- 13 a) Explain the principle and procedure for designing FIR filter using rectangular window.
b) Design a filter with $H_d(e^{j\omega}) = e^{j\omega}, \pi/4 \leq \omega \leq \pi/4$
 $0, \pi/4 \leq \omega \leq \pi$
Using a Hamming window with $N = 7$.
- 14 a) With help of equation explain sampling rate conversion by a rational factor I/D.
b) Derive an expression for the spectrum of output signal of an decimator.
- 15 a) Explain the function of Barrel Shifter in the digital signal processor.
b) Compare general purpose and DSP processors.
- 16 a) Discuss the properties of DFT.
b) Explain the advantage and drawback of Bilinear transformation.
- 17 a) What is a Hamming window function? Obtain its frequency domain characteristics.
b) Discuss the computationally efficient implementation of decimator in an FIR filter.

FACULTY OF ENGINEERING
BE 3/4 (Mech.) II-Semester (Backlog) Examination, October 2020

Subject: Metal Cutting and Machine Tool Engineering

Time : 2 Hours

Max. Marks: 75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 Sketch a single point cutting tool and indicate various tool angles on it.
- 2 Draw the velocity triangles and give an expression for chip velocity and velocity along shear plane in terms of cutting velocity.
- 3 List out the different tool materials and give their compositions.
- 4 Draw and explain the flank and crater wear processes in a single point cutting tool.
- 5 Explain the process of temperature measurement using tool-work piece thermocouple.
- 6 Give an expression for Taylor's tool life equation and how do you define a tool life.
- 7 What are the different parameters that effect the tool life?
- 8 Draw neatly and differentiate between a shaper and a planer.
- 9 What are the different factors considered while designing jigs and fixtures?
- 10 What is 3-2-1 principle of Jigs and fixtures?

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 In an orthogonal cutting process the following data was observed.
 $t = 0.26\text{mm}$, $F_h = 100\text{N}$, $F_v = 100\text{N}$, $r_t = 0.40$, $\alpha = 18^\circ$, $b = 3\text{mm}$, $V = 30\text{m/min}$
 Determine the following using merchant's analysis (i) friction angle
 (ii) Shear angle (iii) resultant cutting force (iv) cutting power
- 12 Draw the merchants circle and derive an expression for optimum shear angle and also give the expressions for F_h , F_v , F_p , F_n , F_s and F_t .
- 13 (a) Discuss about the different cutting fluids and list out the advantages and disadvantages of cutting fluids.
 (b) Listout and explain the different tool wear mechanisms.
- 14 (a) Explain the different methods of tools temperature measurement.
 (b) Draw neatly an engine lathe and label its parts.
- 15 (a) Give the classification of milling machines and draw neat figures.
 (b) Sketch a universal dividing head and explain how it can be used for making 17 divisions on a blank by following simple indexing.
- 16 (a) Explain the different types of bonds used in making grinding wheels.
 (b) What are the different gear manufacturing processes, draw and explain.
- 17 Draw and explain the process of ECM and AJM and discuss their advantages, disadvantages and applications.

FACULTY OF ENGINEERING
BE 3/4 (Prod.) II-Semester (Backlog) Examination, October 2020

Subject: Metal Casting and Welding

Time : 2 Hours

Max. Marks: 75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 What is casting mould?
- 2 Differentiate between open and closed mould in casting process.
- 3 Why Die casting is preferred in high volume production?
- 4 State four reasons for selecting investment casting over other processes.
- 5 What are plug welds?
- 6 What is spot and seam weld?
- 7 Define is resistance welding.
- 8 State low, moderate, high heat input welding processes –
 (i) PAW, (ii) SAW, (iii) OFW, (iv) FW, (v) EBW
- 9 What are composite materials?
- 10 State the mechanical properties of thermo plastics.

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) The flow rate of liquid metal into the downsprue of a mold = 1 liter/sec. The cross-sectional areas at the top of the sprue = 800mm^2 , and its length = 175mm. What area should be used at the base of the sprue to avoid aspiration of the molten metal?
 (b) What are internal and external chills, sketch the location / placement of internal and external chills?
- 12 (a) A horizontal true centrifugal casting process is used to a Aluminum ring with the following dimensions : Length 5 cm, outside diameter 65cm and inside diameter 60cm, (a) Determine the rotational speed that will provide a G-factor 60, (b) Suppose that the ring were made out of steel instead of Aluminum. If the rotational speed computed in a part (b) were used in the steel casting operation. Determine the G-factor and (c) centrifugal force per square meter (Pa) on the mold wall, (d) would this rotational speed results in successful operations?
 (b) Discuss seven factors in the design considerations of casting a component.
- 13 (a) Sketch the cross section of typical fusion weld joint (i) principal zones, (ii) typical grain structure.
 (b) A fillet weld is used to join two medium carbon steel plates each having a thickness of 5mm. The plates are joined at a 90 angle using a inside fillet corner joint. The velocity of the welding head is 6mm/sec. Assume that the cross section of the weld bead approximates a right isosceles triangle is 0.8 and the melting factor is 0.58. Determine the rate of heat generation required at the welding source to accomplish the weld.

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- 14 (a) Sketch resistance welding cycle of pressure and current with respect to time.
(b) Explain the weld Heat affects on joint with respect to (i) welding metallurgy
(ii) thermal induced residual stress (iii) effect of thermal stress
- 15 (a) Explain working process of injection multi layer blow molding with neat sketch.
(b) Discuss the procedure by sketch Testing Spot weld by cross-tension.
- 16 (a) The cavity of a casting mold has dimensions: $L = 250\text{mm}$, $W = 125\text{mm}$,
 $H = 20\text{mm}$. Determine the dimensions of the final casting after cooling to room temperature
if the cast metal is Aluminum. Assume the mold is full at the start of solidification and that
shrinkage occurs uniformly in all direction. The volumetric contraction due to Aluminum –
solidification shrinkage % 7.0 and solid thermal contraction % is 5.6.
(b) A groove weld has a cross-sectional area is 0.045cm^2 and is long 10cm.
(a) what quantity of heat (joules) is required to accomplish the weld, if the metal to be welded
is medium carbon steel? (b) How much heat must be generated at the welding source if the
heat transfer factor 0.9 and the melting factor 0.7?
- 17 A sand core used to form the internal surface of steel casting experiences a
buoyancy force of 23kg. The volume of the mold cavity forming the outside surface of the
casting = 5000cm^3 . What is the weight of the final casting? Ignore shrinkage.

FACULTY OF ENGINEERING
BE 3/4 (AE) II-Semester (Backlog) Examination, October 2020

Subject: Performance & Testing of Automotive Vehicles

Time : 2 Hours

Max. Marks: 75

PART – A

Note: Answer any seven questions. (7x3 = 21 Marks)

- 1 Explain with a neat sketch aerodynamics effects on vehicle function.
- 2 Define aerodynamic lift.
- 3 Write the classification of clutch.
- 4 Explain briefly traction resistance.
- 5 List out the main troubles of brakes and their causes.
- 6 Will tyre and road condition effects the fuel economy ? How?
- 7 Sketch a stabilizer bar.
- 8 Explain RAC rating.
- 9 Explain how the gear box is to be tested.
- 10 Explain how the brakes are to be tested.

PART – B

Note: Answer any three questions. (3x18 = 54 Marks)

- 11 (a) What is the difference between the traction and tractive effort?
(b) How is rolling resistance related to vehicle speed?
- 12 (a) Describe the construction and working of constant mesh gear box.
(b) How will you find the total gear ratio from engine to rear wheels for the above gear box?
- 13 (a) What are the factors that affect the performance of an engine?
(b) Define engine rating and explain RAC, SAE, DIN rating.
- 14 (a) List out five steering system troubles and their causes.
(b) Explain the advantages of torque rod with neat sketch.
- 15 (a) Explain briefly vehicle testing on chassis dynamometer.
(b) Mention briefly two engine testing methods.
- 16 (a) What is power required for propulsion?
(b) Explain brake bleeding in hydraulic braking system with neat sketch.
- 17 (a) Explain valve resistance and combustion time.
(b) State the testing procedure for clutch assembly.

FACULTY OF ENGINEERING
B.E. 3/4 (CSE) II-Semester (Backlog) Examination, October 2020

Subject : Design and Analysis of Algorithms

Time : 2 Hours

Max. Marks: 75

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

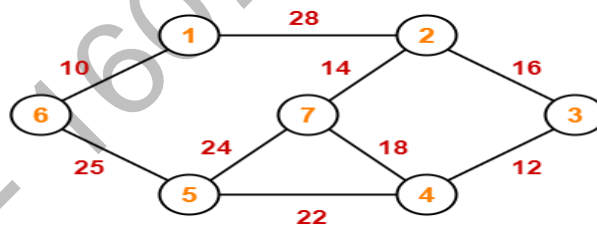
- 1 Define Big-O, Omega and Theta notations.
- 2 State the weighted UNION & FIND rules.
- 3 Define Greedy Knapsack problem.
- 4 What do you understand by divide and conquer strategy?
- 5 Give an example of any problem and give its feasible and optimum solution.
- 6 Define Bi-Connected components and Articulation points.
- 7 What is Hamilton Cycle? Give example.
- 8 State N-queens problem.
- 9 What is NP-completeness?
- 10 State Cook's theorem.

PART – B

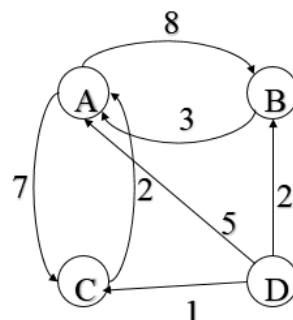
Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) Write an algorithm to sort N numbers in ascending order using Heap sort and analyze time complexity in best, average and worst cases.
 (b) Sort the given numbers using Heap sort. 28,43,9,18,74,53,94,36,13,11.
- 12 Define spanning tree and explain Prim's and Kruskal's Algorithm for finding minimum spanning of the graph using the graph given below.



- 13 (a) Explain the algorithm and find an optimal binary merge pattern for ten files whose length are 28,43,9,18,74,53,94,36,13,11.
 (b) Explain about Huffman codes in detail with an example.
- 14 Explain about all pairs shortest path problem for the following graph and write an algorithm along with the complexity.



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- 15 Following cost matrix is defined for a travelling salesman problem. Obtain reduced cost matrix and state space tree generated by LCBB method. Label each node with cost estimation. [10]

$$\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$$

- 16 Define Non Deterministic algorithm. Write non-deterministic algorithm for searching and sorting.
- 17 Answer any **two** of the following.
- Differentiate between 0/1 Knapsack problem and Knapsack problem.
 - Write notes on Multistage graph.
 - Write short notes on Optimal Merge Pattern using greedy method.

FACULTY OF ENGINEERING**B.E. 3/4 (I.T) II – Semester (Backlog) Examination, October 2020****Subject: Data ware Housing & Data Mining****Time: 2 Hours****Max.Marks: 75****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

- 1 List the fundamentals of Data Mining.
- 2 What is the need of pre-processing?
- 3 State the Apriori principle
- 4 What is 'slice' operation?
- 5 Describe confusion matrix with an example
- 6 List the methods to discover association rules
- 7 What are tree construction principles?
- 8 What are advantages of the decision tree over other classification techniques?
- 9 Write briefly about spatial data mining.
- 10 What is text mining?

PART – B**Note: Answer any three questions.****(3x18 = 54 Marks)**

- 11 a) What are the data mining technologies used? Discuss.
b) What are the major issues in Data mining?
- 12 a) What is the data warehouse modeling? Explain.
b) Define enterprise warehouse, data mart and virtual warehouse.
- 13 a) Describe the methods to discover association rules.
b) Define a FP-tree. Discuss the method of computing a FP-tree.
- 14 a) How to evaluate the accuracy of classifier?
b) Explain prediction and Bayesian Belief Networks.
- 15 a) What are the requirements for cluster analysis?
b) Explain Grid-based methods.
- 16 a) What is text mining? Discuss.
b) What are data mining trends? Explain.
- 17 a) Write short notes on the following:
 - i) KDD process
 - ii) Data reduction.b) Explain multimedia mining.

FACULTY OF ENGINEERING**B.E. (Civil) VI – Semester (CBCS) (Backlog) Examination, October 2020****Subject: Structural Engg. Design & Detailing – I (Concrete)****Time: 2 Hours****Max.Marks: 70****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

1. Differentiate between a combined footing and isolated footing.
2. When is a key needed in a retaining wall and what is the suitable location for it?
3. What are one way and two way shear in footing?
4. Differentiate between circular and rectangular water tanks.
5. How do you calculate the hoop stress in water tanks?
6. How do you design the staging?
7. How the class – AA track loading differs from class – A loading?
8. Write a note on Pigeaud's curves for bridges.
9. What is dispersion length? Explain.
10. Explain the various stability checks to be performed in retaining wall design.

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 Design a Trapezoidal footing for two columns A and B spaced 5m centre to centre. Column A and B is 300mm x 300mm in size and transmits a load of 600kN and 900kN respectively. The maximum length of footing is restricted to 7m only. The safe bearing capacity of soil is 150kN/m². Use M30 and Fe415 grade materials. Sketch reinforcement details.
- 12 Design the stem and counter fort of a counter fort retaining wall for a leveled back fill of 5m above the ground level. Unit weight of the back fill is 18kN/m³. Angle of repose is 30° and safe bearing capacity of soil is 200kN/m². Adopt M20 and Fe415 grade material. Sketch reinforcement details.
- 13 Design a circular water tank having internal diameter of 10m and has a maximum height of water as 4m. The walls of the tank are restrained at the base. Use M30 grade concrete and Fe415 grade steel. Sketch the reinforcement details.

14 An RC Intze water tank supported on six column is required to store 2,00,000 litres of water.

Design the Intze type water tank using the following data:

Height of staging above ground level : 12m

SBC of soil at site : 180kN/m²

Materials used M30 and Fe415 grades.

15 Design a deck slab bridge for the following parameters:

Width of carriage way : 7.5m

Width of clear span : 5.5m

Width of foot path : 1.0m on either sides

Wearing coat thickness : 100mm

Loading : IRC Class A Loading

Materials : Concrete M25 and Steel Fe415.

Sketch the reinforcement details.

16 Design an interior panel of a T-beam bridge with an effective size of 2.5m x 4.0m. Adopt M25 and Fe415 grades of material. Thickness of the slab may be taken as 250mm and thickness of wearing coat as 75mm. Design for class A loading. Sketch reinforcement details. Use Pigaud's Curves.

FACULTY OF ENGINEERING

B. E. (EEE/Inst.) (CBCS) VI – Semester (Backlog) Examination, October 2020

Subject: Microprocessors & Microcontrollers

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. Name the conditional flags of 8086 microprocessor.
2. Indicate the addressing modes of the following instruction:
(a) MOV DL, AFh.
(b) MOV CL, [BX].
3. What is meant by 'Procedure' in assembler programming?
4. What is the difference between assembly language and machine language?
5. What is an interrupt in 8086?
6. What are the steps in interfacing peripherals with the microprocessor?
7. What is the status of all registers on reset in 8051?
8. How much maximum external program memory can be interfaced with 8051?
9. Mention the addressing modes of 8051 microcontroller.
10. Discuss the difference between the instructions MOV A, 05H and MOV A, #05H.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

11. Explain the architecture of 8086 microprocessor with help of a neat schematic.
12. With an example, explain the following 8086 instructions:
(a) POP (b) CMP (c) JNZ (d) NOT (e) SHR
13. (a) Write 8086 Assembly Language program to multiply two 16-bit numbers.
(b) Explain the following 8086 directives
(i) ENDM (ii) SHORT
14. Draw the Internal architecture of 8255 and explain its different modes in detail.
15. Draw the pin diagram of 8051 micro controller and explain each pin function in detail.
16. With examples, explain the typical instruction set of 8051 microcontroller.
17. Write an assembly language program for averaging two numbers in 8051.

FACULTY OF ENGINEERING
B.E. (ECE) VI-Semester (CBCS)(Suppl.) Examination, October 2020

Subject : Microprocessor and Microcontroller

Time : 2 Hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 Explain the operation of the $\overline{\text{BHE}}$ and A_0 pins of the 8086 processor.
- 2 If the data segment register DS contains 4000H, what physical address will the instruction MOV AL, [234B] read?
- 3 What is an interrupt vector table? Specify the function of type3 interrupt.
- 4 Draw the control word format of 8255 and explain function of each bit.
- 5 List out any four features of 8051.
- 6 What is the function of port 0 in 8051?
- 7 Write four addressing modes of 8051 with examples.
- 8 Distinguish between microprocessor and microcontroller.
- 9 Describe the function of each bit in TCON Register of 8051.
- 10 Explain PSEN and $\overline{\text{EA}}$ signals of 8051.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11(a) Draw the register organisation of 8086 and explain typical applications of each Register.
 (b) Explain the function of the following signals of 8086.
 i. ALE ii. HOLD iii. HLDA iv. $\overline{\text{DT/R}}$ v. $\overline{\text{DEN}}$
- 12 (a) Write the differences between macro and procedure.
 (b) Explain the internal architecture of 8251 with a neat sketch.
- 13 (a) Explain the special function registers of 8051 with a neat diagram.
 (b) Write an ALP to find sum of three bytes stored in external RAM memory of 8051.
- 14 (a) Write ALP to generate triangular wave using DAC interface to 8051.
 (b) Explain interrupt structure of 8051 and its priorities.
- 15 (a) Write a program to transfer "ECE" serially at 4800 baud rate continuously.
 Show the configuration of all the registers required.
 (b) Explain neatly the interfacing of 8051 with stepper motor interface.
- 16 (a) Interface the following memory ICs with 8086
 (i) Two 2KB EPROMS ending at FFFFF
 (ii) Two 2 KB SRAMs with starting address at 00000
 (b) What are the assembler directives? List five assembler directives and explain.
- 17 (a) Write ALP using 8051 to generate 1ms square wave using Timer/Counter.
 (b) Explain 804 ADC interface to 8051 with a neat circuit diagram.

FACULTY OF ENGINEERING**B.E. (Mech./Prod.) VI-Semester (CBCS)(Backlog) Examination, October 2020****Subject : Refrigeration and Air Conditioning****Time : 2 Hours****Max. Marks: 70****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

- 1 Define Refrigerant and classify.
- 2 Differentiate between Open cycle & Closed cycle air refrigeration system.
- 3 Show the effect of super heating and sub cooling on P-H and T-S chart for simple vapour compression refrigeration system.
- 4 What is the use of accumulator in Vapour compression system?
- 5 What are the properties of thermoelectric materials used in thermoelectric refrigeration?
- 6 What are the desirable properties of substances to be used as combination of refrigerant and absorbent in vapour absorption system?
- 7 Define (i) Dry Bulb Temperature (ii) Relative Humidity
- 8 Sketch layout of a psychometric chart.
- 9 Define Bypass factor in air conditioning.
- 10 What are the applications of air conditioning?

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 (a) What are the desirable properties of refrigerants?
(b) Explain the working of any one air craft air refrigeration system.
- 12 (a) How multiple compression system with flash inter cooling can produce low Temperatures? Explain with a sketch.
(b) An Ammonia vapor compression refrigerator has an effective swept volume of $0.298\text{m}^3/\text{min}$. condensation and evaporation takes place at 28.9°C and -12.2°C resp. There is no under cooling and the gas temperature after compression is 51.2°C . Taking C_p for superheated vapour as 2.89, Determine
 - (i) Dryness fraction of vapour as it enters the compressor
 - (ii) The rate of circulation of ammonia in kg/min
 - (iii) The rate of extraction of heat in kJ/min
 - (iv) The heat rejected in the condenser per min

Temp $^\circ\text{C}$	Enthalpy		Entropy		Specific volume m^3/kg
	Liquid	Latent	Liquid	Evap.	
28.9	320.53	1148.06	1.082	3.798	0.106
-12.2	125.7	1307.28	0.506	5.00	0.406

- 13 (a) Give the complete working of Electrolux refrigeration system.
(b) Explain the working of practical ammonia water absorption system.
- 14 (a) What is psychrometry? Explain chemical dehumidification process.
(b) Explain ASHRAE comfort chart.

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- 15 (a) What are the various parameters considered for cooling load calculation?
(b) Explain year round air conditioning system.
- 16 (a) What are the various types of fans and blowers used in Air Conditioning?
(b) Explain the working of pulse tube refrigeration.
- 17 (a) What are future refrigerants?
(b) What is the use of flash chamber in vapour compression system?

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FACULTY OF ENGINEERING

B.E. VI Sem. (CBCS) (A.E.) (Backlog) Examination, October 2020

Subject: Performance of Testing of Automotive Vehicles

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2=10 Marks)

1. Discuss what are the affects of rear end geometry and front end geometry on drag coefficient?
2. Name the forces and movements acting on a car body.
3. List out the various parts of a power transmission system.
4. What is the purpose of sliding dog clutch?
5. Write some effects on fuel economy by tyre and road condition?
6. How do you ensure safety of the vehicle? Justify with your answer.
7. What are the types of front end suspension?
8. Draw the layout of air brakes.
9. Explain how the suspension is to be tested.
10. List any two engine testing noises with problem sources.

PART – B

Note: Answer any four questions.

(4x15=60 Marks)

11. a) Explain draw bar pull.
b) How to determine centre of gravity (CG) of a vehicle.
12. a) Describe the construction and working of sliding mesh gear box.
b) How will you find the total gear ratio from engine to rear wheels for the above gear box?
13. a) Explain briefly any 3 types of engine ratings.
b) Explain valve resistance and combustion time.
14. a) Explain brake bleeding in hydraulic braking system with neat sketch.
b) Explain the advantages of radius bar with neat sketch.
15. a) Explain the testing procedure for clutch assembly.
b) Explain the testing procedure for suspension system.
16. a) What is the difference between the traction and tractive effort?
b) What are the factors that affect the thermal efficiencies of the IC engine?
17. a) List out five steering system troubles and their causes.
b) Explain briefly two engine testing methods.

FACULTY OF ENGINEERING

B. E. VI – Semester (CBCS) (CSE) (Backlog) Examination, October 2020

Subject: Software Engineering

Time: 2 hours

Max. Marks: 70

PART – A

Note: Answer any five questions.

(5x2=10 Marks)

1. Define software. Describe changes about nature of software.
2. List the tasks involved in Requirement Engineering.
3. Define quality function development.
4. List the goals of good design.
5. What does a state diagram represent?
6. Differentiate between design process and design quality?
7. What are user interface design rules.
8. List golden rules of interface.
9. List the metrics for source code.
10. What is faulty based testing?

PART – B

Note: Answer any four questions.

(4x15=60 Marks)

11. Explain about RAD and incremental models.
12. What is an agile process? Discuss about any agile process model.
13. Explain briefly about COCOMO.
14. How are you going to translate analysis model to design model.
15. Define component and mention its different views of a component.
16. What is the purpose of design and explain characteristics of good design.
17. Write short notes on
 - (i) Effort Estimation
 - (ii) Work Product
 - (i) Milestone & Activity.

FACULTY OF ENGINEERING

B.E VI – Semester (CBCS) (I.T.) (Backlog) Examination, October 2020

Subject: Web Application Development**Time: 2 Hours****Max. Marks: 70****PART – A****Note: Answer any five questions.****(5x2=10 Marks)**

- 1 Define general format of URL and explain its different parts of a URL.
- 2 Write about <section>, <article> & <nav> elements of html5.
- 3 What is a valid xml document.
- 4 State the reasons for preferring XML schemas over DTDs?
- 5 Compare XML and JSON.
- 6 Illustrate the basic selectors in jQuery.
- 7 What is data binding in Angular JS?
- 8 What is the difference between **ng-show/ng-hide** directives?
- 9 What is Full Stack Java script Development?
- 10 Write the syntax to create a collection and to drop a collection in Mongo DB?

PART – B**Note: Answer any four questions.****(4x15=60 Marks)**

- 11 Develop and demonstrate an HTML document that illustrates the use of external style sheet, ordered list, table, borders, padding, color, and the tag
- 12 Create an Html document to demonstrate the following jQuery methods.
a. fade In b. fadeout c. fade Toggle d. Show e. Hide
- 13 Create a CD catalog (title, artist, country, price, year) using XML and publish it using XSLT.
- 14 What is \$http Service in AngularJS? Demonstrates the use of \$http service in a controller to send HTTP GET request in an Angular JS Application?
- 15 Explain the SMACK pipeline data architecture with a neat diagram.
- 16 a) Explain the following with example
(i) Unordered lists
(ii) Ordered lists
(iii) Nested lists
(iv) Definition lists
b) Explain JSON object. What are the various data types supported by JSON?
- 17 Write about the following:
a) Mongo DB
b) Apache Cassandra
c) Angular JS Validation
