

FACULTY OF ENGINEERING
B.E.3/4 (Civil) II – Semester (Backlog) Examination, March/April 2021

Subject: Steel Structures

Time: 2 hours

Max. Marks: 75

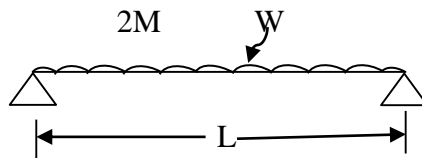
Note: Missing Data, if any, may be suitably be assumed.

PART – A

Answer any seven questions.

(7x3=21 Marks)

- 1 What are different types of welds and draw the figs.
- 2 For the figure given below, calculate collapse load.



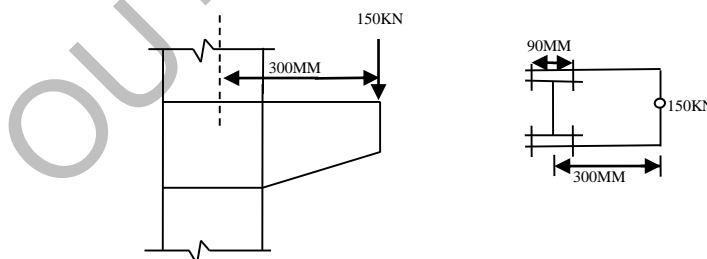
- 3 What are the different types of pitches & gauges in limit state design and also write permissible values.
- 4 What is shear lag- effect & net section rupture ?
- 5 Draw the different type of splices of plates & angle sections in tension members.
- 6 Draw the different types of splices in compression members.
- 7 Calculate shape factor value for circular section.
- 8 What is plastic shear & bulking resistance in beams?
- 9 Differentiate between web bulking & web crippling in beams.
- 10 Draw the Cross section and longitudinal section of Gusset plate.

PART – B

Answer any three questions.

(3x18 = 54 Marks)

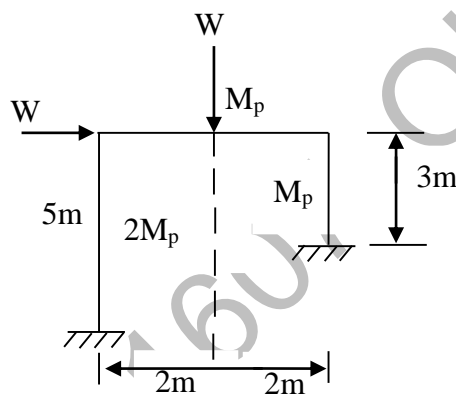
- 11 Design a bolted bracket connection to support on end reaction of 300 kN because of the factored loads supported by the beam. The eccentricity of the end reaction is as shown in fig. the steel used is of grade Fe-410. Use bolts of grade 4.6, thickness of bracket plate may be taken as 10 mm, the column section ISHB -150 @300.19N/M



- 12 (a) A tie member consists of an ISA – (80x 50x8) mm is welded to a 12 mm thick gusset plate @site design welded to transmit load equal to the design strength of member.
- (b) An ISA – (100x 100x 10) mm carries a fractured tensile force of 150 Kn. It is to jointed with a 12mm thick gusset plate. Design a high strength bolted joint (HSFG).
 - i) When a slip permitted
 - ii) Slip is not permitted steel is of grade Fe-410.

Contd...2

- 13 Design a bridge truss diagonal subjected to a factored tensile load of 250KN, the length of the diagonal is 2.5M. The tension member is connected to a gusset plate 14mm thick with one line of 18mm diameter bolts of grade 8.2.
- 14 Design a built-up-Column 10M long to carry factored axial load of 1100KN. The column is restrained in position but not in direction at both the ends. Provided single lacing system with bolted connections. Assume steel of grade Fe-410 & bolts of grade 4.6 the two columns with two channels placed back to back.
- 15 Design a laterally supported beam of effective span 7M, maximum bending moment 200KN-M, maximum shear force 250KN. Use Fe-410 steel.
- 16 A column ISHB-300@561.58N/M carries an axial compressive factored load of 1500KN. Design a suitable bolted gusset base. The base rests on M-15 Grade concrete pedestal. Use grade 4.6 & 20mm diameter bolts making connections.



- 17 a) Find out collapse load for the given following portal frame.
b) Write short notes on purlin design steps.

FACULTY OF ENGINEERING**BE 3/4 (EEE) II Semester (Backlog) Examination, March/April 2021****Subject: Electrical Machinery-III****Time: 2 hours****Max. Marks: 75****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any seven questions.****(7x3=21 Marks)**

1. What are the effects of harmonics in synchronous machine?
2. Define Voltage Regulation.
3. Draw the phasor diagram for over excited synchronous motor.
4. Write the applications of stepper motor.
5. Draw the functional representation of Linear Induction motors.
6. Draw the characteristics of A.C. servo motors.
7. Find the frequency of emf generated in a 4-pole alternator running with 1440rpm.
8. What are inverted V curves?
9. Define (a) Transient state stability (b) Steady state stability
10. Draw the Power – angle characteristics.

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

11. The open circuit and short circuit test readings for a 3-phase, star connected, 1000kVA, 2000V, 50Hz synchronous generator is:

Field amps	10	20	25	30	40	50
Line EMF(v)	800	1500	1760	2000	2350	2600
SC current (A)	--	200	250	300	--	--

The effective armature resistance is 0.2Ω /phase. Using Ampere-Turn method, Find the Full Load Voltage Regulation at (i) 0.8 pf lagging (ii) 0.8 pf leading.

12. (a) Derive the EMF equation of synchronous generator.
(b) Draw the Phasor diagrams of Alternator at (i) upf (ii) lagging p.f. (iii) leading p.f.
13. Explain Parallel operation of alternators with
(a) Three lamp method (b) Synchroscope.
Write the advantages of parallel operation of alternators?
14. (a) What are the starting methods of a synchronous motor? Describe in detail.
(b) With suitable diagrams, explain how a synchronous condenser is used in a power system?
15. Write short notes on:
a) Switched reluctance motor
b) Transient stability of synchronous machine connected to infinite bus.
16. (a) Explain the Two phase Servo motor.
(b) Explain Double field revolving theory.
17. Explain the following
(a) Compensated and Uncompensated AC series motor.
(b) windings in alternator .

FACULTY OF ENGINEERING**B.E. 3/4 (Inst.) II-Semester (Backlog) Examination, March / April 2021****Subject : Process Control****Time: 2 hours****Max. Marks: 75****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any seven questions.****(7x3=21 Marks)**

- 1 What are the elements of process dynamics?
- 2 A thermometer requires 5 minutes to indicate 98% of the response to sudden input. What is the time constant?
- 3 Define proportional band
- 4 Identify proportional band

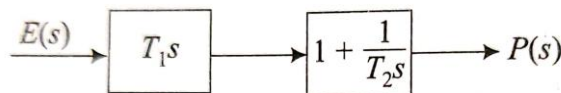


figure.1

- 5 Define stabilization.
- 6 Distinguish between P controller and PD controller
- 7 What is an actuator?
- 8 What are the different signal transmission standards in process industries?
- 9 Draw the ladder logic for NAND gate
- 10 What is the function of counter in PLC programming?

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

- 11 Explain clearly about interacting system and also find it's transfer function
- 12 a) Explain the temperature control system indicating all the elements of process control loop
b) Explain in detail about three position controller
- 13 Explain in detail P+I+D controller and also obtain it's electronics implementation
- 14 Discuss the effects of proportional controller on
 - a) Single capacitance process
 - b) Time constant process
- 15 a) Explain in detail about solenoid valve with necessary diagram
b) Explain clearly about pneumatic actuators
- 16 a) Explain the relay controller with necessary circuit diagram
b) Explain PLC oration.
- 17 Write short notes on
 - a) Process degree of freedom
 - b) Control valve sizing
 - c) Single speed floating controller

FACULTY OF ENGINEERING**B.E. 3/4 (ECE) II – Semester (Backlog) Examination, March / April 2021****Subject: Digital Signal Processing****Time: 2 hours****Max. Marks: 75****Note: Missing Data, if any, may be suitably be assumed.****PART – A****Answer any seven questions.****(7x3=21 Marks)**

- 1 What are Twiddle factors of the DFT?
- 2 Compute the Fourier transform of the signal $x(n) = u(n) - u(n-1)$
- 3 Define Bilinear Transformation
- 4 Write the expression for location of poles of normalized Butterworth filter
- 5 Why rectangular windows are not used in FIR filter design in window method?
- 6 What is the necessary condition and sufficient condition for the linear phase characteristic of a FIR filter?
- 7 What are the drawbacks in multistage implementation?
- 8 What is the use of anti aliasing filter in decimation?
- 9 Write the features of TMS320C54x processor
- 10 What are the advantages of DSP processors in relation to general purpose processors?

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

- 11 a) Compute the DFT for the sequence (1, 1, 1, 1, 1, 1, 0, 0) using DIT FFT.
b) Derive and draw the 4 point FFT-DIF butterfly structure.
- 12 a) Design a digital Butterworth filter satisfying the following specifications
 $0.7 \leq |H(e^{j\omega})| \leq 1, 0 \leq \omega \leq 0.2\pi$
 $|H(e^{j\omega})| \leq 0.2, 0.6\pi \leq \omega \leq \pi$ with $T = 1$ sec
 b) For the analog transfer function $H(s) = 2 / (s+1)(s+3)$.
 Determine $H(z)$ using bilinear transformation. With $T = 0.1$ sec.
- 13 a) Design a HPF of length 7 with cut off frequency of 2 rad/sec using Hamming window. Plot the magnitude and phase response.
b) Explain the need for the use of window sequence in the design of FIR filter.
- 14 a) Explain the concept of decimation by a factor D and interpolation by factor 1.
b) Draw the block diagram of a multistage interpolator and explain it.
- 15 a) What is MAC? Explain its operation in detail.
b) What are the various addressing modes used in the TMS320C54X processor?
- 16 a) Explain how linear convolution of two finite sequences are obtained via DFT.
b) Discuss the limitations of designing IIR filter using Impulse invariant method.
- 17 a) What is a Kaiser window? In what way is it superior to other window functions?
b) Draw and explain the poly phase structure of a interpolator.

FACULTY OF ENGINEERING
BE 3/4 (Mech.) II-Semester (Backlog) Examination, March/April 2021

Subject: Metal Cutting and Machine Tool Engineering

Time: 2 hours

Max. Marks: 75

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

PART – A

Answer any seven questions.

(7x3=21 Marks)

- 1 What are the different types of chips produced and under what conditions?
- 2 Neatly draw a drilling and a broaching tool and label its angles and parts.
- 3 What cutting fluids are used in machining, list out their desired properties?
- 4 What is meant by BUE and under what conditions it is formed?
- 5 Explain infrared photographic technique of tool temperature measurement.
- 6 Explain the taper turning process by compound rest set over method.
- 7 Draw a jig boring machine and explain its importance.
- 8 Sketch and explain a crank and slotted lever mechanism used on a shaper.
- 9 Draw at least two clamping devices and explain.
- 10 Sketch neatly the gear hobbing process and explain.

PART – B

Answer any three questions.

(3x18 = 54 Marks)

- 11 The following data is observed in a machine process using a H.S.S. tool Rake angle = 15° , cutting speed (V) = 80m/min, uncut thickness (t) = 0.25mm, length of uncut chip = 200mm, length of chip = 180mm, main cutting force (F_h or F_y) = 380N, horizontal force (F_x or F_v) = 108N, Calculate (i) chip thickness ratio (ii) Shear angle (iii) friction angle (iv) horse power (v) optimum shear angle using Merchant's force analysis.
- 12 (a) Name the different tool materials and give their composition and properties.
 (b) Draw the velocity triangles and give an expression for chip velocity (V_c) and velocity along shear plane (V_s) in terms of main cutting velocity.
- 13 (a) Give an expression for Taylor's tool life and discuss the various parameters that effect the tool life in general.
 (b) Sketch and explain the differences between shaper and a planer.
- 14 (a) Sketch a universal dividing head and explain the process of indexing for 13 divisions on a blank by simple indexing.
 (b) What are the different operations that can be performed on lathe, explain.
- 15 (a) How are drilling machines classified, draw neat figures and discuss their features?
 (b) What are the different thread manufacturing processes, draw and discuss?
- 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 EDM and LBM and discuss their advantages, disadvantages and applications.

FACULTY OF ENGINEERING
BE 3/4 (Prod.) II-Semester (Backlog) Examination, March/April 2021

Subject: Metal Casting and Welding

Time: 2 hours

Max. Marks: 75

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

PART – A

Answer any seven questions.

(7x3=21 Marks)

- 1 Define fluidity of metal.
- 2 What is the difference between a pattern and a core in sand molding?
- 3 State the difference between shell moulding and CO₂ process in casting.
- 4 What are different parts produced by continuous casting?
- 5 State the difference between brazing and soldering.
- 6 State types of joints in welding process.
- 7 What are variables in Resistance welding?
- 8 Mention applications of plastic process.
- 9 What are MEMS applications?
- 10 State the mechanical properties of thermosetting materials.

PART – B

Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) Molten metal can be poured into the pouring cup of a sand mold at a steady rate of 1000cm³/sec. The molten metal overflows the pouring cup and flows into the downsprue. The cross-section of the sprue is round with a diameter at the top=3.4cm. If the sprue is 25cm long, determine the proper diameter at its base so as to maintain the same volume flow rate.
 (b) Derive the engineering analysis of pouring to determine the mould fill time.
- 12 (a) True centrifugal casting operation is performed horizontal to make large diameter copper tube sections. The tube have a length 1.0m, diameter 0.25m, wall thickness 15mm. (i) if the rotational speed of the pipe is 700 rev/min, determine the G-factor on the molten metal, (ii) If the rotational speed sufficient to avoid "rain" (iii) what volume of the molten metal must be poured into the mold to make the casting if solidification shrinkage and contraction after solidification are considered.
 (b) Sketch seven general casting defects.
- 13 (a) The welding power generated in a particular arc-welding operation=3000W. This is transferred to the work surface with a heat transfer factor = 0.9. The metal to be welded is Copper whose melting point 3250K, Assume that the melting factor = 0.25. A continuous fillet weld is to be made with a cross sectional area = 15mm². Determine the travel speed at which the welding operation can be accomplished.
 (b) State in what situation these solid state welds area applied (i) Friction weld, (ii) forge weld, (iii) thermal expansion, (iv) surface condition, (v) change in the microstructure.

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- 14 (a) Sketch of Resistance Spot Weld with temperature generation.
(b) Explain the weldability criteria for the following factors (i) Melting point, (ii) Thermal conductivity, (iii) thermal expansion, (iv) surface condition, (v) change in the microstructure.
- 15 (a) Explain working process of injection molding reciprocating screw with sketch.
(b) State the five reasons for welding problems in (i) cracking of weld metal, (ii) cracking in base metal, (iii) porosity, (iv) inclusions.
- 16 (a) A riser in the shape of a sphere is to be designed for a sand casting mold. The casting is a rectangular plate $L = 200\text{mm}$, $W = 100\text{mm}$, and thickness = 18mm . If the total solidification time of the casting itself is known to be 3.5 min , determine the diameter of the riser so that it will take 25% for the riser to solidify.
(b) A tungsten gas arc welding operation is performed at a current of 300A and voltage of 20V . The melting factor $f_2 = 0.5$, and the unit melting energy for the metal $U_m = 10\text{J/mm}^3$. Determine (a) power in the operation, (b) rate of heat generation at the weld and (c) volume rate of metal welded
- 17 A sand core located inside a mold cavity has a volume of 157.0cm^3 . It is used in the casting of cast iron pump housing. Determine the buoyance force (N) that will tend to lift the core during pouring. The density of cast iron is 7.16g/cm^3 .

OU - 1607

FACULTY OF ENGINEERING
B.E. 3/4 (CSE) II-Semester (Backlog) Examination, March/April 2021

Subject : Design and Analysis of Algorithms

Time: 2 hours

Max. Marks: 75

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

PART – A

Answer any seven questions.

(7x3=21 Marks)

- 1 Define space complexity.
- 2 What is the weighted union rule? Give example.
- 3 Write the control abstraction of Divide and Conquer.
- 4 Define principle of optimality.
- 5 What is the multistage graph problem?
- 6 Define an Articulation point. Give example.
- 7 What are explicit and implicit constraints of backtracking?
- 8 State the Purging rule.
- 9 What is meant by Satisfiability?
- 10 What is Halting problem?

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PART – B

Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) Write and explain asymptotic notations.
 (b) What is Hashing? Explain collision in Hashing.
- 12 (a) Write an algorithm 'select' that finds the k^{th} smallest element in an array.
 (b) Sort the keys using merge sort:
 (100,300,150,450,250,350,200,400,500). Show each steps.
- 13 (a) Write short note on DFS.
 (b) For the identifier set $(a_1, a_2, a_3, a_4) = (\text{end, goto, print, stop})$ with
 $(p_1, p_2, p_3, p_4) = (3, 3, 1, 1)$ and $(q_0, q_1, q_2, q_3, q_4) = (2, 3, 1, 1, 1)$. Construct an OBST.
- 14 (a) Explain lower bound theory.
 (b) Solve the knapsack problem using backtracking for the following
 problem $p = \{11, 21, 31, 33, 43, 53, 55, 65\}$ and $w = \{1, 11, 21, 23, 33, 43, 45, 55\}$, $m = 10$, $n = 8$.
- 15 (a) What is a clique decision problem?
 (b) Write a Non-deterministic algorithm for sorting.
- 16 (a) Explain about Huffman codes.
 (b) Find an optimal binary merge pattern for 10 files whose lengths are:
 $\{28, 32, 12, 5, 84, 53, 91, 35, 3, 11\}$.
- 17 Write about:
 (a) minimum Cost Spanning Trees with example.
 (b) Optimal Storage on tapes.

FACULTY OF ENGINEERING

B. E. 3/4 (IT) II – Semester (Backlog) Examination, March / April 2021

Subject: Dataware Housing & Data Mining

Time: 2 hours

Max. Marks: 75

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

PART – A

Answer any seven questions.

(7x3=21 Marks)

1. What are the different application areas of data mining?
2. What kinds of patterns can be mined?
3. What do you mean by facts and dimensions in a data warehouse schema?
4. What is “Pivot” as an OLAP operation?
5. Define support and confidence of an association rule.
6. Define a frequent set. Define an association rule.
7. What is a decision Tree?
8. What are advantages and disadvantages of the decision tree approach over other approaches of data mining?
9. What is an outlier? What are the types of outliers?
10. What is web mining?

PART – B

Answer any three questions.

(3x18 = 54 Marks)

11. (a) What are the major issues in data mining? Discuss.
(b) How to measure data similarity and dissimilarity.
12. (a) Explain MOLAP Vs ROLAP in detail.
(b) Give one case study in Data warehouse implementation.
13. (a) What are constraint based frequent pattern mining.
(b) What are frequent item set mining methods.
14. (a) What are general approach to classification?
(b) What are lazy learners and what are other classification methods?
15. (a) Explain K-medoids clustering algorithm.
(b) What are partitioning methods?
16. (a) What are the challenges of outlier detection?
(b) Explain Bayes classification methods.
17. (a) What are data mining applications and web mining?
(b) What is Back propagation? Discuss.

FACULTY OF ENGINEERING
BE VI - Semester (CBCS) (CE) (Backlog) Examination, March / April 2021

Subject: Structural Engineering Design & Detailing-I (Concrete)

Time: 2 Hours

Max .Marks: 70

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

PART – A

Answer any seven questions.

(7x4=28 Marks)

- 1 Are combined footings economical compared to isolated footings? Explain.
- 2 When do you use trapezoidal combined footings?
- 3 Mention the types of retaining walls with neat sketch.
- 4 Mention the components of a counterfort retaining walls and their behavior.
- 5 Explain the main criteria in the design of water tanks.
- 6 Name the stresses to which circular domes are subjected and their expressions.
- 7 State the assumptions in the design of staging for overhead water tanks.
- 8 How is the width of carriage way decided for highway bridges?
- 9 Briefly explain effective width method.
- 10 What are the limitations of courbon's method?

PART – B

Answer any two questions.

(2x21= 42 Marks)

- 11 Design a combined footing for two columns, carrying factored loads of 1500kN and 1200kN, spaced 5m apart. The columns are 450mmx450mm in cross section, S.B.C. of soil is 150kN/sq.m. Use M20grade concrete and Fe415 grade steel.
- 12 Design a counterfort retaining wall to support 4.5m high backfill. The unit weight of backfill is 17kN/m³, angle of internal friction is 35°, and SBC of soil is 150kN/m³.
- 13 Design a circular water tank, of capacity 200kl and 5m height. It is resting on ground and wall is rigidly connected to the base. Use M30 grade concrete and Fe415 grade steel. Detail the wall and the base slab.
- 14 Design the rectangular water tank of dimensions 3.5mx3.5mx5m height. It is resting on ground. Adopt M25 grade concrete and Fe 500 grade steel. Detail the wall and base slabs.
- 15 Design a solid slab bridge for IRC class AA track loading for the following data:
 Effective span=6m; clear width of road way=7.5 m; width of footpaths 1.5m on either side of carriageway; thickness of wearing coat=75mm. Use M25 grade concrete and Fe415 grade steel. Assume missing data; if any.
- 16 Design an exterior T-beam of a T-beam bridge for the following data:
 Clear width of road way=7.5m, Effective span=15m,
 Live load: for IRC Class AA-tracked loading. Wearing coat=75mm.
 Use M25 and Fe500 grades.

FACULTY OF ENGINEERING
BE VI - Semester (CBCS) (EEE/EIE) (Backlog) Examination, March / April 2021

Subject: Microprocessors & Microcontrollers

Time: 2 Hours

Max .Marks: 70

PART – A

Answer any five questions.

(5x2=10 Marks)

- 1 What is the function of SI and DI register in 8086?
- 2 List various status flags and control flag of 8086 processor.
- 3 What is difference between debugger and loader tool in assembly language programming.
- 4 List the various string instruction in 8086 with an example.
- 5 Write important features of 8255 PPI.
- 6 Write the important feature of 8253.
- 7 Why 8051 is called 8 bit microcontroller? What are the widths of data bus and address bus of 8051?
- 8 How much ON-Chip RAM is available for 8051?
- 9 Explain the instructions MOV A, @R₀ and MOV A, # 05h.
- 10 Give the various application of 8051.

PART – B

Answer any four questions.

(4x15= 60 Marks)

- 11 Write an example to each explain all the addressing modes of 8086 microprocessor.
- 12 (a) Explain the architecture of 8255 PPI.
(b) Mention the operating modes of 8255?
- 13 (a) Explain the functions of counters in 8051 microcontrollers.
(b) Explain the functions of timers in 8051 microcontrollers.
- 14 (a) Explain with example the jump and call instruction of 8051 microcontroller.
(b) Write a program to find number odd numbers in set of five 8 bit number using 8051 controller.
- 15 With examples, explain the addressing modes of 8051 microcontroller.
- 16 (a) Distinguish between minimum and maximum modes of operation of 8086.
(b) Discuss the segmented memory of 8086 with neat schematic.
- 17 (a) Discuss the various interrupts of 8086.
(b) Define macro with an example.

FACULTY OF ENGINEERING

B.E. VI – Semester (ECE) (CBCS) (Backlog) Examination, March / April 2021

Subject: Microprocessors & Microcontrollers

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. Differentiate between minimum and maximum mode of 8086. How is mode switching done.
2. Calculate the value of carry flag, parity flag, sign flag, overflow flag when C7h is added to 9Dh.
3. Mention the interrupt pins in 8086 and briefly explain interrupt operations.
4. Given SS=2000h SP=FFFFh. Calculate the value of SP after execution of two PUSH instructions.
5. Draw the structure of I/O port 0 of 8051.
6. Enlist three difference between microprocessor and microcontroller.
7. Draw the structure of TCON register.
8. Write a program to transfer a byte of data from internal RAM to accumulator using indirect addressing mode.
9. Generate a square wave on P1.0 of 8051.
10. Draw the structure of stepper motor.

PART-B

Answer any four questions.

(4x15=60 Marks)

11. Describe the architecture of 8086 microprocessor and explain the operation of various registers. Also explain the memory segmentation in 8086.
12. a) Write an assembly language program using string manipulation instructions to copy a string from location 2000:5000 to location 1000:A000. Length of string is 6 bytes. Assume sample data.
b) Interface two 4kX8 EPROMS and two 4kX8 RAM chips with 8086, select suitable maps.
13. a) Give the structure of internal RAM of 8051. Mention any five special function registers with their internal RAM address.
b) Write an assembly language program in 8051 to find sum of series of data stored in internal RAM 92h to 96h and store the result in 97h.
14. a) What are the serial communication modes in 8051. Explain the related SFRs.
b) Write an assembly program to display alternate LEDs connecting to port 1 of 8051.
15. Interface the 8051 with a DAC and generate a triangular wave of 0 to 3V with a frequency of 100Hz.
16. a) Write a program to calculate the number of ones and zeroes in a byte of data stored in 5000h. Store the result in 5001h and 5002h.
b) Draw the architecture of 8255 and give the format of CWR of 8255 in I/O and BSR mode.
17. a) Explain the address data demultiplexing using ALE pin of 8051.
b) Explain the interrupt control of 8051 with respect to IE and IP register

FACULTY OF ENGINEERING**BE VI - Semester (CBCS) (M/P) (Backlog) Examination, March / April 2021****Subject: Refrigeration & Air Conditioning****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 Classify refrigerants.
- 2 Differentiate between open and closed bell Coleman cycle.
- 3 Sketch P-H and T-S diagram of simple vapour compression refrigeration system.
- 4 What are types of condensers used in vapour compression refrigeration system?
- 5 Compare vapour compression and vapour absorption system.
- 6 Mention few applications of cryogenics.
- 7 Define (i) Relative humidity (ii) Dry bulb temperature
- 8 Sketch ASHRAE comfort chart.
- 9 Define SHF (Sensible Heat Factor).
- 10 What are different types of filters used in air conditioning systems?

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

- 11 (a) Explain reversed Carnot cycle with P-V and T-S diagram and mention what are its limitations.
(b) A 5 ton refrigerating machine operating on bell Coleman cycle has pressure limits of 10 bar and 1 bar. The temperature of air before compression is 10°C. The compressed air is cooled to 40°C before it enters and expander. Assuming both compression and expansion to be adiabatic with $\gamma = 1.4$. Determine
 - (a) COP
 - (b) Mas of air ciuculated per min
 - (c) Powe rating of motor assuming 90% mechanical efficiency
 Assume $C_p = 1.0 \text{ kJ/kg K}$
- 12 (a) Explain working of compound vapour compression refrigeration system with water intercooling.
(b) The temperature limits of an ammonia refrigerating system are 25°C and -10°C, if the gas is dry at the end of compression, calculate the COP of the cycle assuming no under cooling of the liquid ammonia. Use the following table for properties of ammonia.

Temp °C	Liquid heat kJ/kg	Latent heat kJ/kg	Liquid entropy kJ/kg K
25	298.9	1166.94	1.1242
-10	135.37	1297.68	0.5443

- 13 (a) Explain the principle and working of steam jet refrigeration system.
(b) What are the additional components used in practical ammonia water absorption system when compared simple system and explain their system.

- 14 (a) What is meant by adiabatic saturation.

(b) The air enters a duct at 10°C and 80% RH at the rate of 150 m³/min and is heated to 30°C without adding or removing any moisture. The pressure remains constant at 1 atm. Determine the relative humidity of air at exit from the duct and the rate of heat transfer.

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- 15 (a) Explain the working of year round air conditioning system.
(b) Discuss energy conservation in air conditioning building.
- 16 (a) Explain thermodynamics of human body.
(b) Explain the working of pulse tube refrigeration system and give its applications.
- 17 (a) Explain the working of flash chamber used in vapour compression refrigeration system.
(b) Define bypass factor of heating coil and cooling coil.

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FACULTY OF ENGINEERING

B.E. VI Sem. (CBCS) (A.E.) (Main & Backlog) Examination, March / April 2021

Subject: Performance & Testing of Automotive Vehicles

Time: 2 hours

Max. Marks: 70

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

PART – A

Note: Answer any five questions.

(5 x 2 = 10 Marks)

1. Explain temperature and humidity effect on power output of engine.
2. Explain the effects of front and geometry on drag coefficients.
3. Why is cone clutch more effective than plane clutch?
4. Why is an idler gear used? Which main shaft gear meshes with the idler gear?
5. Explain how fuel economy will change with tyre and road conditions.
6. Write short notes on vehicle safety.
7. What are the types of front end suspension?
8. Draw a neat sketch of radius bar.
9. Explain the testing procedure for emissions.
10. Explain the testing procedure for ignition timing.

PART – B

Note: Answer any four questions.

(4 x 15 = 60 Marks)

11. Explain with neat sketch.
 - a) Forces and moments acting on a car body
 - b) Types of Resistance acting on a car body.
12.
 - a) Describe the construction and working of diaphragm clutch.
 - b) Describe the construction and working of constant mesh gear box.
13.
 - a) What are the factors that affect the performance of an engine?
 - b) Explain briefly engine rating.
14. Explain briefly rack and pinion steering gear mechanism.
15. Explain the following:
 - a) Vehicle testing on chassis dynamometer.
 - b) Types of engine tests.
16. Explain the mechanics of hydraulic single-line braking system with the help of neat sketch.
17.
 - a) Draw and explain Torsion bar, and Damper.
 - b) What is the difference between IMEP and BMEP?

FACULTY OF ENGINEERING
BE VI - Semester (CBCS) (CSE) (Backlog) Examination, March / April 2021

Subject: Software 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 What is software metric?
- 2 What are the CMM process patterns?
- 3 What are the various modelling approaches in analysis model?
- 4 What are function points?
- 5 What is quality assurance?
- 6 Write short notes on pattern based software design.
- 7 Define cycloramic complexity?
- 8 How do you prioritize requirements?
- 9 Define abstraction and refinement.
- 10 List the goals of SQA.

PART – B

Answer any four questions.

(4x15= 60 Marks)

- 11 Describe the content, advantages and disadvantages of spiral & incremental process model?
- 12 Explain about planning principles and modeling principles?
- 13 Discuss briefly the scenario based modeling?
- 14 Explain how a dataflow is mapped into software architecture?
- 15 (a) Explain Tom McCabe basis path testing with an example?
(b) Write short notes on boundary value analysis (BVA)?
- 16 (a) Distinguish between black box and white box testing techniques?
(b) Write short notes on SQA plan?
- 17 Write notes on
 - (a) Agile process model
 - (b) Art of Debugging

FACULTY OF ENGINEERING
BE VI - Semester (CBCS) (IT) (Backlog) Examination, March / April 2021

Subject: Web Application Development

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 Briefly explain the DNS process.
- 2 Differentiate HTML and XML.
- 3 What is the purpose of <space> and <div> tags in HTML?
- 4 What is the purpose of XML Schema?
- 5 Mention two advantages of XML Schema over DTDs?
- 6 What are the different types of CSS?
- 7 What do you mean by a dynamically typed language?
- 8 Mention two differences between JSON and XML.
- 9 What is the purpose of \$scope in angularJS?
- 10 What is the purpose of express.JS?

PART – B

Answer any four questions.

(4x15= 60 Marks)

- 11 (a) Explain the pseudo classes with a suitable program.
(b) Design an XHTML form to include the following elements.
(i) Text boxes (ii) Check boxes (iii) Radio buttons (iv) Submit and reset buttons
(Note: Choose a suitable situation for the above form)
- 12 (a) Explain DTD with an example.
(b) Explain how to publish XML document using XSLT.
- 13 Demonstrate the usage of various CSS selectors in JQuery with the help of example programs.
- 14 (a) Explain how to access JSON using HTML.
(b) What are the various data types in JSON? Explain briefly.
- 15 (a) Write short notes on MEAN stack.
(b) Create a web server using node .JS which responds to client requests.
- 16 (a) What are the advantages of mongo DB?
(b) What is data sharding in mongo DB? Explain.
- 17 Write short notes on the following:
(a) Angular.JS expressions (Demonstrate with a program)
(b) SMACK stack
(c) Event Handling in JavaScript