

FACULTY OF ENGINEERING**B.E. VI – Semester (CBCS)(Civil) (MAIN) Examination, May/2019****Subject: Structural Engineering Design & Detailing-I (Concrete)****Time:3 Hours****Max.Marks:70****Note: Answer all questions from Part A & any three questions from Part-B.****Part – A (20 Marks)**

1. Why is it necessary to combine the footing?
2. In the design of combined footing, the critical section for
 - a. One way shear is _____
 - b. Two way shear is _____
3. Give expression for coefficient of active earth pressure on the stem of a retaining wall for sloped filling.
4. Explain the principles of design of staging.
5. Differentiate between flexible joint and rigid joint in water tanks.
6. How do you check stresses in the design of water tanks?
7. What are the design forces that acts on the middle ring beam of an Intze Tank?
8. What are the different classes of loads (IRC) available for the design of road bridges?
9. Explain the effective width method.
10. What is impact factor? Write down its formula.

Part – B (50 Marks)

11. Design a combined footing for the two columns separated by a distance of 4m centre to centre :
 Column A is 500mm square and carries a load 1200kN,
 Column B is 600mm square and carries a load 1600kN.
 The safe bearing capacity of soils 200kN/m^2 ,
 Use M20 and Fe415 grade material. **(15 Marks)**

(OR)
12. Design a cantilever retaining wall, retaining backfill up to 4.5m from ground level. The backfill is subjected to a traffic load of 18kN/m^2 , angle of repose of soil is 30° and its unit weight of soil is 18kN/m^3 . SBC of soil is 16kN/m^2 coefficient of friction between concrete and ground may be taken as 0.4. use M20 and Fe415 grade material. Sketch reinforcement details.
13. Design a rectangular water tank 5m x 8m resting on ground for the capacity of 15,00,000 (15 Lakhs) litres. Use M25 grade concrete and HYSD steel, draw the cross-sectional elevation of the tank showing reinforcement details. **(15 Marks)**

(OR)
14. Design a circular water tank resting on ground with flexible base for a capacity of 4,00,000Litres, Depth of storage is 4.5m with a free board of 500mm. Use M30 and Fe415 grade materials. Sketch reinforcement details.

Contd..2

15. A simply supported RC slab is required for the deck slab of a road bridge having the following data : **(20 Marks)**

Width of carriage way : 7.0m

Width of clear span : 4.5m

Width of kerb : 500mm

Width of bearing : 300mm

IRC Class AA loading for tracked vehicle. Use M30 and Fe415 grade steel. Sketch reinforcement details.

(OR)

16. Design a Rc slab on a RC T-beam and slab deck using the following details :

Spacing of main T-beam : 3m

Span of T-beams : 20m

Type of loading : IRC Class A loading

Materials used : M30 and Fe500 Grade.

Sketch the reinforcement details.

FACULTY OF ENGINEERING

B.E. (EE/Inst.) VI - Semester (CBCS) (Main) Examination, April / May 2019

Subject : Microprocessors and Microcontrollers

Time : 3 hours

Max. Marks : 70

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

PART – A (10 x 2 = 20 Marks)

- 1 Discuss the process of pipelining in 8086.
- 2 Name the flags of 8086.
- 3 What is the internal memory of 8086?
- 4 Explain the difference between Jump and CALL instructions.
- 5 Discuss the function of M/IO in 8086.
- 6 a) Which interfacing with 8086 involves in the process of sensing a key actuation, debouncing and generating codes.
b) What is INTR and NMI in 8086?
- 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 implicit addressing mode of 8051 with syntax followed by an example.
- 10 Explain the instructions MOV A, @Ri and MOV A, #data8.

PART – B (5 x 10 = 50 Marks)

- 11 Write an example to each explain all the addressing modes of 8086 microprocessor. 10
- 12 a) Distinguish between minimum and maximum modes of operation of 8086. 5
b) Discuss the segmented memory of 8086 with neat schematic. 5
- 13 a) Write an Assembly Language Program to subtract two 8-bit signed numbers. 6
b) Explain the following 8086 Directives 4
i) ENDP ii) ASSUME
- 14 Explain the procedure to interface a matrix keyboard to 8086 with neat schematic. 10
- 15 a) Explain the architecture of 8051 microcontroller with neat sketch. 5
b) Write an assembly language program for 8051 to add five 8-bit BCD numbers and store the result in external memory. 5
- 16 With examples, explain the addressing modes of 8051 microcontroller. 10
- 17 Explain the control transfer instructions of 8051 with example for each. 10

FACULTY OF ENGINEERING**B.E. VI – Semester (CBCS)(ECE) (Main) Examination, May 2019****Subject: Microprocessors & Microcontrollers****Time: 3 Hours****Max Marks: 70****Note: Answer all questions from Part-A & answer any five questions from Part-B****PART – A (20 Marks)**

1. Explain how pipe line is implemented in 8086? (2)
2. Indicate the addressing modes of the following instructions. (2)
 - a) MOV CL, 0FFH
 - b) MOV AL, [BX]
3. What are the memory pointers in 8086 processor? (2)
4. If the content of the register BX=0FFFFH. What is the value in BX after the execution of the NEG BX instruction. (2)
5. Write BSR word to set the PC₇ of PPI 8255. (2)
6. Explain each bit in the PSW register of 8051 (2)
7. Write the code required to make timer1 and serial interrupts as higher priority interrupts(2)
8. Write alternate pin functions of Port 3 of 8051 (2)
9. Explain the use of following signals In 8051 (2)
 - i) \overline{RD}
 - ii) \overline{EA}
 - iii) ALE
10. Calculate the value of TH and TL to generate 10 microsecond delay using timer, when 8051 is connected, with 12MHz crystal. (2)

PART – B (50 Marks)

11. (a) Differentiate between the Macros and procedures in Microprocessor. (5)
 - (b) Explain the string manipulation Instructions of 8086. (5)
12. (a) What are the functions of 8251? Discuss the various modes of operations. (5)
 - (b) Explain read timing diagram of 8086 in minimum mode. (5)
13. (a) Write an ALP in 8086 to transfer 100 bytes from source location to destination location using string instructions, assume suitable data. (5)
 - (b) Explain addressing modes of 8086. (5)
14. Explain 8051 micro controller architecture and explain internal RAM is organization. (10)
15. (a) Write an ALP for 8051 to add a BCD array of 10 bytes. (5)
 - (b) Explain the procedure to interface D/A converter to 8051, generate a saw tooth Waveform. (5)
16. (a) Explain the modes of operation of timers and counters of 8051. (5)
 - (b) Write a program to transmit character 'M' continuously at a band rate of 4800. Give the configuration of all registers required. (5)
17. Write short notes on any two of the following: (10)
 - a) LCD interfacing with 8051
 - b) I/O Post structures of 8051
 - c) DMA interfacing to 8086

FACULTY OF ENGINEERING

B. E.VI – Semester (CBCS)(M/P)(Main) Examination, April / May 2019

Subject: Refrigeration & Air Conditioning

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part – A & any five questions from Part-B**PART – A (10 x 2 = 20 Marks)**

1. Classify refrigerants.
2. Define refrigeration and air conditioning.
3. What is the use of accumulator in vapour compression refrigeration system.
4. What is super heating in vapour compression system represent it on P-H diagram.
5. Define (i) Peltier effect (ii) Thompson effect.
6. What is Cryogenics? What are application of Cryogenics?
7. What is chemical dehumidification process?
8. What is human body self defense mechanism?
9. Define RSHF(Room Sensible Heat Factor)
10. What are applications of air conditioning system?

PART – B (50 Marks)

11. (a) Explain the working of regenerative air refrigeration system with the help of layout diagram and graphs.
 (b) A refrigerating machine of 6 tons capacity working on bell Coleman cycle has an upper limit of pressure is 5.2 bar. The pressure and temperature at the start of compression is 1 bar and 289K. The compressed air cooled at constant pressure to a temperature of 314K enters the expansion cylinder. Calculate.
 (i) COP (ii) Quantity of air in circulation per minute.
 (iii) Power required to run the unit and
 (iv) Piston displacement and bore for compressor and expander if unit runs at 240 rpm and stroke length is 200 mm. Assume double acting and $\gamma = 1.4$
 $c_p = 1.003 \text{ kJ/ kg – K}$.
12. 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 respectively. 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.

Contd...2

Temp °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) Explain the working of practical NH₃-H₂O absorption system with the help of layout diagram.
 (b) Explain the working of pulse tube refrigeration system.
14. (a) Explain the thermodynamics of human body.
 (b) Define (i) DBT (ii) RH (iii) DPT. Also indicate these properties on psychrometric chart.
15. (a) Explain by Pass factor for heating and cooling coil.
 (b) Explain the working of year round air conditioning system.
16. (a) What are the various loads to be considered for cooling load calculation in an air conditioning system.
 (b) Find the vapour pressure, specific humidity and enthalpy of saturated air at a temperature of 32°C.
17. (a) Derive the expression for C.O.P in a simple vapour absorption system.
 (b) What is cascade refrigeration system what are its advantages?

FACULTY OF ENGINEERING
B.E. VI – Semester (CBCS)(A.E.) (Main) Examination, May 2019

Subject: Performance & Testing of Automotive Vehicles

Time : 3 Hours

Max. Mark: 70

PART – A (20 Marks)

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

1. Name the forces and moments acting on a car body.
2. Explain Temperature and humidity effect on power output.
3. Draw a single plate clutch and name the parts.
4. List out types of automotive gear box.
5. How will the Traffic conditions and driving Habits effect the fuel economy?
6. State a short note on Vehicle safety.
7. State the characteristics of automotive brakes.
8. Explain-Stabilizer and Radius bar-application
9. Explain how the steering is to be tested?
10. List any two engine testing noises with pollution sources.

PART – B (50 Marks)

11. Explain briefly the following.
 - (i) Rolling Resistance
 - (ii) Drag Resistance
 - (iii) Grade Resistance
12. (a) Describe the construction and working of constant Mesh Gear box.
(b) How will you find the total gear ratio from engine to the rear wheels?
13. Derive an expression for frictional Torque acting on multiplate clutes.
14. Draw the Rack and Pinion Steering assembly and Explain the principle of operation.
15. Explain with a neat sketch effects of body roll and irregular road surfaces on suspension geometry.
16. a) Draw and explain Hydraulic braking system Mechanism.
b) Explain Torsion bar with suitable sketch.
17. Explain the following:
 - a) Corrosion testing
 - b) Chassis dynamo meter test.

FACULTY OF ENGINEERING**B.E. VI – Semester (CBCS)(CSE) (Main) Examination, April/May 2019****Subject: Software Engineering****Time : 3 Hours****Max. Mark: 70****PART – A (20 Marks)****Note: Answer all questions from Part – A & any five questions from Part-B.**

- | | |
|---|---|
| 1. What are umbrella activities? Give an example? | 2 |
| 2. What is an agile process? List few agile, Process Models | 2 |
| 3. What are the principles of modeling? | 2 |
| 4. What is the role of requirements engineer in requirements elaboration phase? | 2 |
| 5. List the goals of a good design. | 2 |
| 6. What is scenario based modeling? | 2 |
| 7. What is the purpose of a Data design? | 2 |
| 8. Differentiate between coupling and cohesion. | 2 |
| 9. What is software quality Assurance (SQA)? | 2 |
| 10. Given any 2 differences between Black box & white box testing. | 2 |

PART – B (50 Marks)

- | | |
|---|----|
| 11. a) Briefly explain evolutionary process models? | 5 |
| b) Explain process framework with an example? | 5 |
| 12. a) Explain about Business process Engineering? | 5 |
| b) What is requirements engineering? Explain about elicitation in detail. | 5 |
| 13. a) Explain in detail about flow oriented modeling. | 5 |
| b) Briefly explain software design process and quality. | 5 |
| 14. Explain Architecture styles and patterns in details. | 10 |
| 15. a) Explain ISO 9000 quality standards. | 5 |
| b) What is debugging? Explain the process of debugging. | 5 |
| 16. a) Explain Object Oriented test strategies. | 5 |
| b) Explain metrics for maintenance. | 5 |
| 17. Explain | |
| (i) Interface Design Steps | 5 |
| (ii) Validation testing | 5 |

FACULTY OF ENGINEERING**B.E. VI – Semester (CBCS) (I.T.) (Main) Examination, April/May 2019****Subject: Web Application Development****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****Part – A (20 Marks)**

1. Differentiate between World Wide Web and Internet (2)
2. State the ordered list tags and unordered list tags in HTML (2)
3. List the uses of XML. (2)
4. Define what is meant by Complex type in XML Schema. (2)
5. Write an array in JavaScript which contains student roll number, name and marks (2)
6. Write the syntax of jQuery selector. (2)
7. Give the syntax for defining an expression in Angular JS. (2)
8. Define the use of ng-app directive in Angular JS. (2)
9. State the components of SMACK stack. (2)
10. Define what is a collection in Mongo DB? (2)

PART – B (50 Marks)

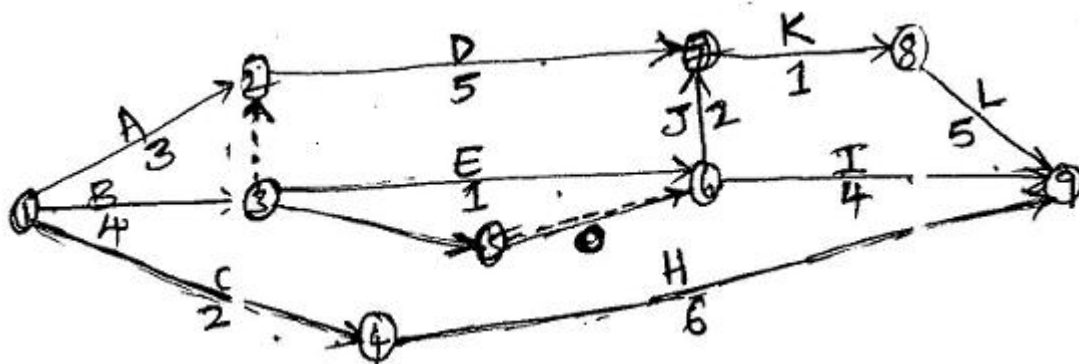
11. a) Explain the different levels of cascading style sheets. (5)
b) Create a HTML document that defines a table with columns for state_name, state_capital, and state_population. There must be at least five rows for states in the table. (5)
12. a) Explain the various features of DTD with the help of examples. (5)
b) Create an XML schema for a catalog of cars, where each car has the following child elements: company_name, model, year, color, and engine type. (5)
13. a) Explain the syntax, uses and data types of JSON. (5)
b) Write JavaScript code to demonstrate keypress, onload, onfocus and onblur events for a document, such that appropriate alert message must be displayed on the occurrence of these events. (5)
14. a) Explain with the help of an example, what is meant by controller in Angular JS. (5)
b) Explain what is meant by two-way data binding in Angular JS. (5)
15. Explain what is meant by full stack application development. Describe in detail, the components of the MEAN stack. (10)
16. a) Explain the architecture and working of Domain Name System with the help of a neat diagram. (5)
b) Write and test a HTML page which includes jQuery code to do the following: demonstrate the set and get functionality of text(), html() and val() methods. The script should contain three buttons to perform these three operations. (5)
17. Write short notes on the following:
 - a) Angular JS Services (5)
 - b) Effects and Events (5)

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) I – Semester (New) (Suppl.) Examination, May 2019****Subject: Construction Management and Administration****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (10 x 2.5 = 25 Marks)**

1. What are the functions of construction management?
2. State different types of organizational structures.
3. What do you mean by a dummy activity?
4. What are the advantages of network diagrams in construction projects?
5. What is float? List different types of float.
6. What is project cost optimization?
7. What do you mean by network updating? Why is it essential?
8. Write the safety measures to be taken for demolition works.
9. What are the applications of linear programming?
10. Write the advantages of linear programming.

PART – B (5x10 = 50 Marks)

- 11 a) Explain the basic principles to be followed to develop an effective organization. (5)
- b) Discuss the merits and demerits of line and staff organization. (5)
- 12 Determine the critical path of the network shown below and calculate earliest project completion time. (10)



- 13 Details of the activity cost and durations of a project are given in the following table.
Indirect cost is Rs.100/day, Determine the optimum duration and cost of the project.

Activity	Dependence	Normal Duration, Days	Normal Cost Rs.	Crash Duration, Days	Crash Cost Rs.
A		7	500	5	900
B	A	4	400	2	600
C	A	6	800	4	1000
D	B,C	7	700	4	1000
E	C,D	5	800	2	1400
F	E,D	6	800	4	1600
G		3	500	2	800

- 14 a) What is a safety plan? Write salient features of safety plan.
b) Describe in detail the stages of awarding a contract.
- 15 a) Write a brief note on Economies of Large scale production.
b) Write a brief note on Detailed Project Report.
- 16 a) Write the important conditions of contract.
b) What are the major causes of accidents in construction industry?
- 17 A site requires a minimum of 10000cu.m of gravel and boulder mixture. The mixture must contain no less than 500 cu.m of gravel and no more than 6000 cu.m of boulder. material may be obtained from two pits.

Pit	Delivery cost Rs/cu.m	Percent gravel	Percent boulder
1	10	40	60
2	14	70	30

Formulate and solve the above LP problem.

(10)

FACULTY OF ENGINEERING
B.E. 4/4 (Inst) I-Semester (Suppl.) Examination, May / June 2019

Subject : Virtual Instrumentation

Time : 3 Hours

Max. Marks: 75

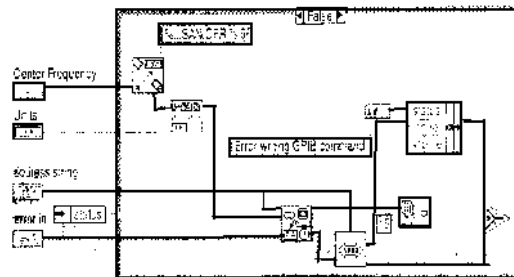
Note: Answer all questions from Part-A and any five questions from Part-B.

Part-A (25 Marks)

- | | |
|--|---|
| 1. Give an overview of virtual instrument and Lab VIEW. | 2 |
| 2. What are the rules for writing virtual instrumentation programs? | 3 |
| 3. Explain in detail about the process involved in Lab VIEW environment. | 2 |
| 4. Draw what in function and control Palette. | 3 |
| 5. Draw the simplified N-bit SAR ADC. | 3 |
| 6. Mention the differences between SAR versus Binary weighted AAC. | 2 |
| 7. Write short notes on Rs 485. | 2 |
| 8. List out the properties of SCXI. | 2 |
| 9. Write short notes on power spectrum. | 3 |
| 10. Draw the diagram of IEEE 488 bus. | 2 |

PART- B (50 Marks)

- | | |
|---|----|
| 11. Explain history and evolution of Virtual Instrumentation. Draw the block diagram of Instrumentation system. | 10 |
| 12 a) With the suitable example, explain loops and charts | 5 |
| b) What are the various modes of formula nodes? Explain. | 5 |
| 13 a) With sketches explain the ADC architecture | 5 |
| b) Write short notes on timing, interrupts and DMA. | 5 |
| 14 a) Explain given below. | 5 |



- | | |
|--|---|
| b) Write sheet notes on Interface buses | 5 |
| 15 a) Explain the concept of power spectrum with suitable Vis. | 5 |
| b) With help of VI explain motor control application. | 5 |
| 16 a) Discuss briefly the architectures of Virtual instrument | 5 |
| b) Write short notes on VI application in various field | 5 |
| 17 a) Write short notes on clusters and graph | 5 |
| b) Write short notes on windowing & filtering application | 5 |

FACULTY OF ENGINEERING
B.E. 4/4 (ECE) I-Semester (NEW)(Suppl.) Examination, May 2019

Subject : Electronic Instrumentation

Time : 3 Hours

Max. Marks: 75

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

Part-A (25 Marks)

- | | |
|---|---|
| 1) A 0-50 V voltmeter is specified to be accurate within 1 % of full scale. Calculate the limiting error when the instrument reading is 15 V. | 2 |
| 2) Mention the different types of errors with examples. | 3 |
| 3) List various types of transducers for temperature measurement. | 2 |
| 4) Explain humidity measurement using capacitive type. | 3 |
| 5) List the advantages of dual slope DVM over ramp type DVM. | 2 |
| 6) Define resting and action potential. | 3 |
| 7) List the advantages and disadvantages of LVDT for displacement measurement. | 2 |
| 8) Explain resistance wire thermometer. | 3 |
| 9) Draw the block diagram of virtual instrumentation. | 2 |
| 10) List the applications of spectrum analyzer. | 3 |

PART-B (50 Marks)

- | | |
|---|---|
| 11. a) What is standard of measurement? Explain the classification of standards. | 6 |
| b) Define accuracy, precision, resolution and sensitivity with examples. | 4 |
| 12. a) Explain the construction, operating principle, advantages and disadvantages of semiconductor strain gauge. | 6 |
| b) Explain how capacitive transducer is used for thickness measurement? | 4 |
| 13. a) With the help of neat diagram, explain the operation of successive approximation type DVM. | 6 |
| b) Explain the operation of delayed time base oscilloscope with a neat block diagram. | 4 |
| 14. a) Explain in detail the various types of Hygrometers. | 6 |
| b) Define sound pressure level, sound power level, sound intensity level and loudness. | 4 |
| 15. a) Explain the operation of ECG machine with a neat block diagram. | 6 |
| b) What are the limitations of X-rays and how they can be overcome by CT techniques? | 4 |
| 16. a) Draw the block diagram of super heterodyne spectrum analyzer. Explain its operation. | 6 |
| b) Explain the working principle of thermocouple. | 4 |
| 17. Write short note on | |
| a) Hot wire anemometer | 5 |
| b) Quality management standards | 5 |

FACULTY OF ENGINEERING**B.E. 4/4 (ECE) I – Semester (Old) Examination, May / June 2019****Subject: Computer Networks****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (25 Marks)**

- 1 Bring out the design issues for layers and the advantages of layered protocol. (3)
- 2 Describe the concept and importance of piggybacking. (2)
- 3 Briefly describe CSMA/CD and CSMA/CA. (3)
- 4 Compare circuit switching and packet switching. (2)
- 5 Explain transport service primitives. (2)
- 6 What is the necessity of fragmentation? Compare transparent and non transparent fragmentation. (3)
- 7 Briefly describe the function of RARP. (2)
- 8 Describe the concept and necessity of tunnelling. (3)
- 9 Briefly describe SMTP. (3)
- 10 Describe the importance of MIME. (2)

PART – B (50 Marks)

- 11 a) What are the limitations of stop and wait protocol? Describe ARQ and sliding window protocol. (6)
- b) Differentiate OSI and TCP/IP model. (4)
- 12 a) Describe IEEE 802.16 standard and compare it with IEEE 802.11. (7)
- b) What are the functions of MAC sub layer? (3)
- 13 a) Explain Hierarchical routing and Distance Vector Routing. (5)
- b) Describe Classless Inter Domain Routing. (5)
- 14 a) Describe IPv6 protocol and bring out its advantages over IPv4. (6)
- b) Briefly describe ATM networks. (4)
- 15 a) List out the applications of TCP and UDP. Describe TCP. (6)
- b) Explain the architecture of DNS. (4)
- 16 a) Differentiate Symmetric key algorithms and public key algorithms (6)
- b) With the help of figure illustrate the basic elements of Product- Cipher. (4)
- 17 Write short notes on any two of the following: (10)
 - a) World Wide Web
 - b) Bluetooth
 - c) Bridges and Routers

FACULTY OF ENGINEERING
B.E. 4/4 (Mech) I-Semester (Suppl.) Examination, May 2019

Subject: Thermal Turbo Machines

Time: 3 Hours

Max. Marks: 75

Note: Answer All Questions From Part-A&Answer Any five Questions From Part-B.

Part – A (10x2.5=25 Marks)

1. Prove that for divergent diffuser, the flow should be subsonic
2. Obtain the relationship between static temperature and dynamic temperature in terms of Mach
3. Define compressibility factor in terms of Mach number
4. Obtain expression for maximum entropy for Fanno curve
5. List out the differences between axial flow compressor and centrifugal compressor
6. What are the functions of pre-whirl of centrifugal compressor
7. Define degree of reaction of reaction steam turbine and how it is different from axial flow compressor
8. Draw pressure and velocity variations across two row velocity compounded turbine
9. Draw Joule cycle and pressure-volume and temperature-entropy diagrams
10. Define work ratio and obtain the expression for maximum pressure ratio of gas turbine cycle

PART-B (5x10=50 Marks)

11. A conical diffuser has entry and exit diameters of 15 cm and 30 cm respectively. The pressure, temperature and velocity of air at entry are 0.69 bar, 340 K and 180m/s respectively. Determine (i) the pressure and velocity at exit, (ii) stagnation pressure and stagnation temperature and (iii) force exerted on the diffuser walls.
12. A combustion chamber in a gas turbine plant receives air at 350 K, 0.55 bar and 75m/s. The air fuel ratio is 29 and calorific value of the fuel is 41.87 MJ/kg. Taking $\gamma = 1.4$ and $R = 0.287$ kJ/kg-K for the gas, determine (i) the initial and final Mach numbers, (ii) final pressure, temperature and velocity of the gas, (iii) percent stagnation pressure loss in the combustion chamber.
13. A centrifugal compressor running at 2000 rpm has internal and external diameters of impellor as 300 mm and 500 mm respectively. The blade angles at inlet and outlet are 22° and 40° respectively. The air enters the impellor radially Determine the work done by the compressor and degree of reaction.
14. An axial flow compressor having 8 stages and with 50% reaction design compresses air in the pressure ratio of 4:1. The air enters the compressor at 20°C and flows through it with a constant speed of 90 m/s. The compressor rotates with a mean speed of 180 m/s. Assume isentropic efficiency of compressor is 82%, $\gamma = 1.4$ and $C_p = 1.005$ kJ/kg-K calculate (i) work done on the compressor and (ii) blade angles.

-2-

15. For one stage of an impulse turbine, isentropic nozzle heat drop=185kJ/kg, nozzle efficiency = 90%, nozzle angle=20°, velocity coefficient = 0.95, velocity of steam at the entry of nozzle is 30 m/s, ratio of blade speed to whirl component of steam speed is 0.5, find a) blade angles if the steam leaves axially, b) work done per kg of steam, c) friction loss over the blades per kg of steam d) kinetic energy loss per kg of steam, c) friction loss over the blades per kg of steam d) kinetic energy loss per kg of steam, e) blade efficiency, f) power developed, and g) axial thrust, if the steam flow rate is 10 kg/sec.
- 16 In an open cycle constant pressure gas turbine, air enters the compressor at 1 bar and 300 K. The pressure ratio is 4:1. The isentropic efficiencies of compressor and turbine are 87% and 85%. The maximum temperature of cycle is 1000 K. Calculate the power developed, work ratio and thermal efficiency of the cycle if the flow rate of air is 2.5 kg/sec. Assume $C_p=1.005 \text{ kJ/kg-K}$, $\gamma = 1.4$ for air and gases.
- 17 a) Explain the working principle of rocket propulsion system with liquid propellant with the help of neat sketch (6 Marks)
b) List out differences between solid propellant and liquid propellant (4 Marks)

FACULTY OF ENGINEERING
B.E. 4/4 (Prod) I-Semester (Suppl.) Examination, May 2019

Subject: Control Systems Theory

Time: 3 Hours

Max. Marks: 75

Note: Answer All Questions From Part-A & Answer Any five Questions From Part-B.

Part – A (25 Marks)

1. Define Transfer function and mention its limitations 2
 2. What is the effect of feedback on overall gain of a control system? 2
 3. The open loop transfer function for a servo system with unity feedback 3
- $G(s) = \frac{20}{s(s+20)}$ Find the static error constants.
4. Define the terms : a) Step signal b) Ramp signal c) Parabolic signal 3
 5. Sketch the polar plot of $G(s) = \frac{1}{s(1+sT)}$ 3
 6. What are the advantages of frequency response techniques over time domain techniques? 3
 7. Define Routh Stability criteria. 2
 8. Define STM and its properties. 3
 9. Define controllability and observability. 2
 10. What is the effect of lead, lag compensations on the system performance? 2

PART-B (50 Marks)

- 11.a) Obtain the transfer function of a Thermal systems. 5
- b) Obtain the transfer function by SFG method. 5

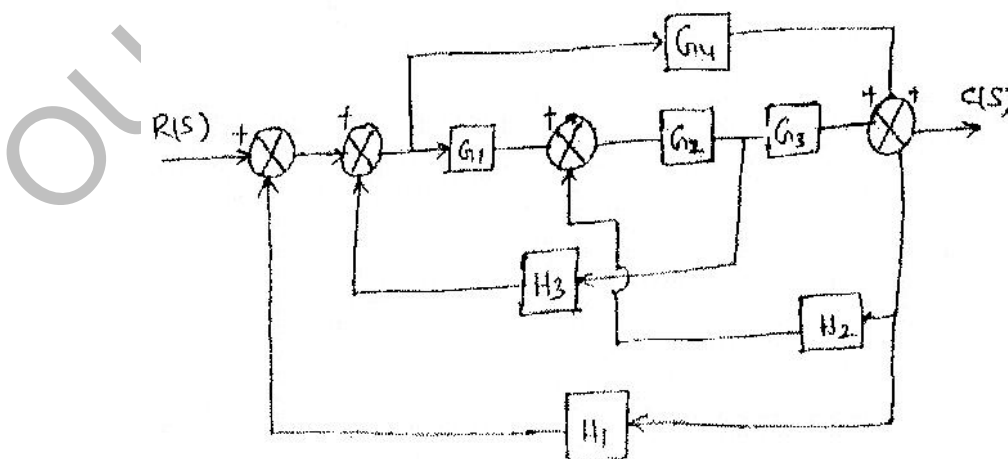


Fig.1

-2-

12. a) Find the Transfer function for the below SFG. 5

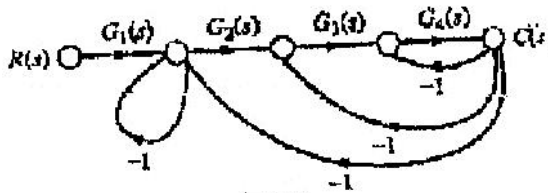


Fig.2

- b) Find steady state error for unit step and Ramp inputs for fig -3 5

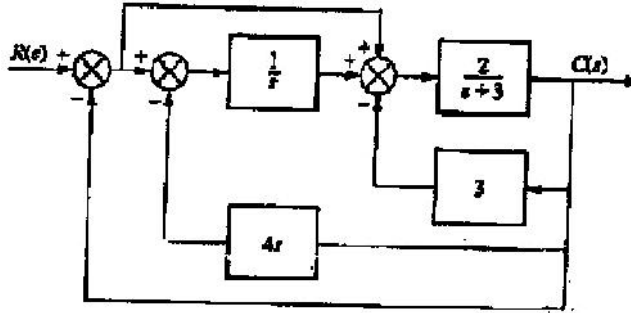


Fig.3

13. Draw the bode plot for the control system $G(s) = \frac{K}{s(1+0.1s)(1+0.05s)}$ 10

14. Sketch the Nyquist plot for the control system 10

$$G(s)H(s) = \frac{1.25(s+1)}{(s+0.5)(s-2)}$$

15. Obtain the State space model and check for the observability of a control system 10

$$\frac{Y(s)}{U(s)} = \frac{s+2}{s^3+9s^2+26s+24}$$

16. Sketch the root locus plot for the control system having

$$G(s)H(s) = \frac{K}{s(s+2)(s^2+4s+8)}$$

Find the range of 'K' that yields a stable system.

17. Discuss the following:

- Linearization and non – linearization systems. 10
- Correlation between transient response and frequency response of a 2nd order system.
- Nyquist stability criteria.

FACULTY OF ENGINEERING
B.E. 4/4 (A.E.) I-Semester (Supp.) Examination, May 2019

Subject : Transport Management

Time : 3 Hours

Max. Marks: 75

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

PART – A (25 Marks)

- 1 What are the types of interview?
- 2 Differentiate between Industrial psychology and personnel management.
- 3 Explain advantages of motor transport.
- 4 Explain Transport department organization structure.
- 5 What is vehicle utilization?
- 6 What are basic factors of bus scheduling?
- 7 What are cautionary signs?
- 8 Classify the permits based on validity period.
- 9 Discuss daily maintenance briefly.
- 10 Differentiate between two-tier and three tier maintenance.

PART – B (5x10=50 Marks)

- 11 (a) Explain various psychological tests. (5)
 (b) Explain types of employment tests. (5)
- 12 (a) Classify and explain the different transport carriers. (5)
 (b) Explain state, public and municipal ownership of motor transport organization. (5)
- 13 (a) Explain direct costs and indirect costs. (5)
 (b) Explain the requirements of a good fare system. (5)
- 14 What are the different types of Traffic signs? Show them with two examples of each sign. (10)
- 15 Explain in detail causes for uneven tyre wear and their remedies. (10)
- 16 Explain facilities required at depot and draw the layout of a depot. (10)
- 17 Write short notes on the following:
 (a) Ticketing system and types of tickets (5)
 (b) Layout of a central workshop (5)

FACULTY OF ENGINEERING
B.E. 4/4 (CSE) I-Semester (Suppl.) Examination, May / June 2019

Subject : Distributed Systems

Time : 3 Hours

Max. Marks: 75

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

PART – A (25 Marks)

- 1 Differentiate between distributed system and computer network. (3)
- 2 What are the types of failures? (2)
- 3 What is java object serialization? Give an example. (3)
- 4 What is thread scheduling? (2)
- 5 What properties should be satisfied for reliable multicast? (3)
- 6 Explain briefly about internal and external synchronization. (3)
- 7 Define distributed dead lock and edge chasing. (2)
- 8 What are the uses of replication? (2)
- 9 What do you mean by weak consistency of shared memory? How is it different from sequential consistency? (3)
- 10 What is "lost update" problem? What are its implications? (2)

PART – B (50 Marks)

- 11 List out the challenges of distributed system. Explain in detail. (10)
- 12 (a) How does the communication takes place between distributed objects? Explain. (7)
 (b) What is marshaling? (3)
- 13 (a) What are Election algorithms? Explain about bully algorithm. (5)
 (b) Explain about distributed debugging. (5)
- 14 What is optimistic concurrency control? How concurrency control can be achieved in distributed transactions. Explain. (10)
- 15 Explain the implementation and working of X.500 Directory Service. (10)
- 16 Explain about SUN network file system. (10)
- 17 Write short notes on:
 - (a) Logical time and logical clock (3)
 - (b) Name service. (3)
 - (c) Consensus in synchronous systems (4)
