Code No. 2659 / CBCS / BL

FACULTY OF ENGINEERING

B.E. (Civil) VI – Semester (CBCS) (Backlog) Examination, November 2020

Subject: Water Resources Engineering – II

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

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

PART – A (5x2 = 10 Marks)

1 Distinguish between a contour and a ridge canal.

2 Differentiate initial and final regime.

3 What is meant by afflux?

4 What is a weir? Draw its cross section.

5 Define exit gradient and write its formula.

6 What is a canal fall?

7 Find the relation between sensitivity and flexibility of an outlet.

8 Determine the longitudinal slope of the channel using Lacey's method, given the silt factor of 1.1 and discharge of 100 cumecs.

9 Write the functions of a cross regulator of a canal.

10 Write the drawbacks of Kennedy's theory for the design of irrigation canals.

PART – B (4x15 = 60 Marks)

11 a) Explain Lacey's silt theory for irrigation canals.

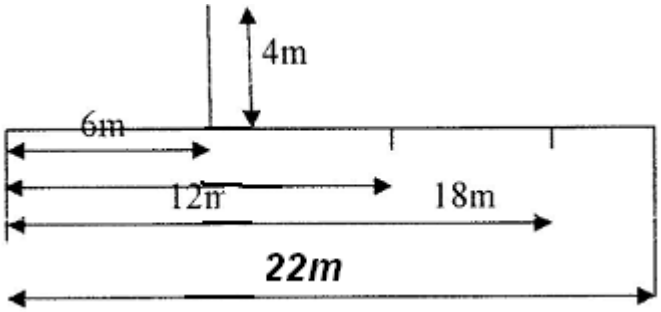
b) Design a lined canal to carry a discharge of 120 cumecs at a slope of 1 in 4000. Take the side slopes as 1.5:1, N=0.015 and the limiting velocity as 1.5 m/s.

12 a) Explain the procedure for the design of a canal head regulator.

b) Draw a layout of the diversion headwork and indicate the various components of the system. Write briefly the function of each component.

13 a) Briefly outline Khosla's theory on design of weirs on permeable foundations. Enumerate various corrections that are needed in the application of the theory.

b) The figure shows the section of a hydraulic structure founded on sand. Calculate the average hydraulic gradient. Also find the uplift pressures at point 6m, 12m and 18m from the u/s end of the floor and find the thickness of the floor at those points using Bligh's theory and take G=2.24.



14 a) Explain the procedure for the design of a trapezoidal notch fall.

b) Describe with neat sketches, the various types of canal escapes.

15 a) Describe with the help of sketches, the various types of cross drainage works.

b) Explain the procedure for design of an irrigation channel using Garret's diagram.

16 a) Distinguish between a weir and a barrage. Explain the various types of weirs with sketches.

b) Discuss Bligh's creep theory for the design of weirs on permeable foundations. What are its limitations?

17 Write short notes on:

i) Methods of lining of irrigation canals
ii) Design procedure of vertical drop weir
iii) Canal Outlets.

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Code No. 2679 / CBCS / BL

FACULTY OF ENGINEERING

B.E. (EEE) VI - Semester (CBCS) (Backlog) Examination, November 2020

Subject : Renewable Energy Technologies

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

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

PART – A (5x2 = 10 Marks)

1 List the differences between conventional and non-conventional energy sources.
2 List the advantages of fuel cell.
3 What is diffuse radiation? What factors affect its intensity?
4 What is the basic principle of wind energy conversion?
5 Define tip-speed ratio.
6 Write short notes on solar energy data collection.
7 What are the advantages of Ocean Energy Conversion Systems?
8 Define tide range with a diagram.
9 List the factors for selection of site for a Bio-Gas plant.
10 What do you mean by reforestation? What is the need?

PART – B (4 x 15 = 60 Marks)

11 a) List the various types of Solar Energy storage system.
b) Explain with a diagram how the thermal energy from a solar pond can be used to drive a Rankine cycle.

12 a) What is a fuel cell? Explain the Hydrogen fuel cell with a diagram.
b) What is Polarization? Explain the Hydrogen fuel cell with a diagram.

13 a) Mention the basic components of WECS and classify the WECS.
b) State the equation that depicts the relation between power in the wind and wind velocity. What is the consideration of this equation in site selection?

14 a) Explain the Savonious rotor with a diagram.
b) Compare the characteristics, advantages and disadvantages of Savonius rotor and Darrieus type rotors.

15 a) List at least five places where there is geothermal occurrence in India. What is the “cold storage plant” commissioned at Himachal Pradesh?
b) List and explain some schemes of the Government to encourage renewable energy source system implementation.

16 a) Give the classification of gassifiers.
b) Explain the downdraft gasifier with a diagram.

17 a) Explain how the Angstrom compensation Pyrheliometer measures the solar radiation with a diagram and derive the equation? Explain with a diagram.
b) Write short notes on
i) Photosynthesis ii) Solar Altitude angle

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Code No.2682/CBCS/BL

FACULTY OF ENGINEERING

B. E. (Inst.)(CBCS) VI– Semester (Backlog) Examination, November 2020

Subject: Electronics Instrumentation Systems

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

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

PART – A (5x2 = 10 Marks)

1. Define Active and Passive Transducers with examples.
2. Draw the schematic of R-2R resistive ladder.
3. Explain the principle of operation of a digital time measurement.
4. What are scaling and checking modes?
5. What is the difference between wave analyzer and a signal analyzer?
6. State the applications of spectrum analyzer.
7. Draw the schematic of Relay switched Attenuator.
8. What is IEEE-488 bus?
9. Mention the applications of C.R.O.
10. What are the basic components of magnetic tape recorder?

PART – B (4 x 15 = 60 Marks)

11. a) Draw the circuit of Instrumentation Amplifier with Op-Amps. Explain the working principle.
    b) With suitable diagram explain ADC successive approximation method.

12. a) Explain automatic ranging and automatic zeroing in digital meters.
    b) Explain the digital frequency measurements with neat block diagram.

13. Explain the types of Harmonic distortion analyzers with suitable diagrams.

14. With necessary diagrams explain in detail about IEEE 488 interface bus.

15. a) Draw the block diagram C.R.O. and explain in detail.
    b) With necessary diagrams explain in detail about digital storage oscilloscope.

16. a) Explain the testing of Radio receiver instrument used in computer controlled instrumentation.
    b) Determine deflection sensitivity and deflection factor of a C.R.O given that with usual notation, L = 50cm,1 – 1.5cm,d=5mm, V=2000V.

17. Write short notes on the following
    a) Dual slope ADC.
    b) IEEE 488 electrical interfacing.

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Code No: 2692/CBCS/BL

FACULTY OF ENGINEERING

B.E (ECE) VI-Semester (CBCS) (Main) Examination, November 2020

Subject : Managerial Economics and Accountancy (Elective-II)

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

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

PART – A (5x2 = 10 Marks)

1. What is Law of supply?
2. State the formula of cross elasticity of demand.
3. Write a note on Discounting principle
4. How to derive profit?
5. Define ISO-Cost production function
6. What do you mean by monopoly
7. Write about temporary working capital
8. What is BRS?
9. Define Journal proper.
10. What do you mean by discounted cash flow method?

PART-B (4x15=60 Marks)

11. What role does the managerial economist play in business?

12. Explain price elasticity of demand. How can it be measured? What are the business uses of price elasticity of demand?

13. From the following details,
    a) Determine the break even points
       Fixed cost = Rs. 25,000
       Variable cost = Rs. 10 per unit
       Selling price = Rs. 15 per unit
    b) What should be the sales volume to make a profit of Rs. 25,000?

14. Compute the profitability index for the projects A and B and choose the best the firm's cost of capital is 10% the cash inflows are

Year	Project A (Rs.)	Project B (Rs.)
0 (initial cost)	70,000	70,000
1	10,000	50,000
2	20,000	40,000
3	30,000	20,000
4	45,000	10,000
5	60,000	10,000

15. Why short-run cost curve is U-shaped? Explain.

16. Explain the need of accounting in a business.

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17. From the following ledger balances of Mr.X, prepare the Trading and profit and loss account for the year ended 31st March, 2004.

Opening stock	Rs. 20,000
Salaries	Rs. 25,000
Sunday expenses	Rs. 2,000
Rent and taxes	Rs. 3,000
Purchases	Rs. 9,000
Freight inward	Rs. 2,500
Advertising	Rs. 1,500
Sales	Rs. 1,85,000
Discount allowed	Rs. 1,800
Discount received	Rs. 1,000

The closing stock was valued at Rs. 18,000

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FACULTY OF ENGINEERING

B.E. VI-Semester (CBCS) (M/P) (Backlog) Examination, November 2020

Subject : Metrology and Instrumentation

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

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

PART – A (5x2 = 10 Marks)

1 State how Tolerance Unit is computed?
2 Based on the variation of tolerance above and below nominal size-state how alphanumeric assemblies of fits are classified.
3 Why optical profile projector is used in tolerance measurement of manufactured parts.
4 What are special features does CMM machine.
5 State the objectives of Machine tool acceptance tests.
6 State the different symbols used to indicate surface roughness.
7 Classify the following into i) sensors transducer, ii) signal conditioners iii) readout:- spring mass, gyro, gearing, dashpot, vane, valving, moving pointer, digital indicator, resistance, amplifying, computer systems.
8 Sketch the response error 2nd order system to ramp excited signal.
9 State the mathematical equation of relationship between temperature resistance in the thermocouple.
10 Sketch the setup of thermocouples in parallel in temperature measurement.

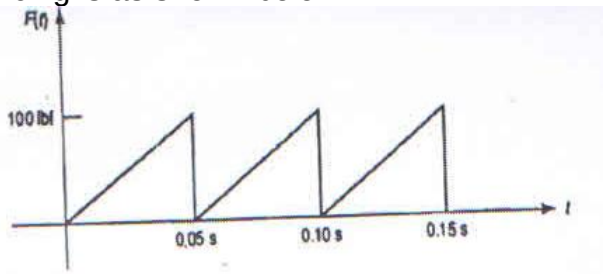
PART – B (4x15=60 Marks)

11 a) What is the i) difference and ii) relation between Tolerance unit and Tolerance grades in manufacturing?
b) Explain with neat sketch the method of Selective Assembly of plain features, both internal and external.

12 a) Explain the principle and operation of free flow and with neat sketch.
b) Explain the Roundness measurement procedure and identification of error roundness with neat sketch.

13 a) Sketch the testing procedure of Lathe machine Bed.
b) Explain how the 3 wire method suitable for measuring threads parameters.

14 a) State the ten desirable properties of grid materials used to measure temperature.
b) Consider a second-order system with a damping ratio or 0.70 and a undamped natural frequency of 50 Hz. If the value of k is 100 N., determine the steady-slate output if the forcing is as shown below.



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15 a) A pressure transducer is constructed from a steel tube having a nominal diameter of 15mm and a wall thickness of 2mm. **a)** if the design stress is limited to 2.75x10e8 Pa, what maximum pressure may be applied to the transducer?
b) For the maximum pressure calculated in part (a), determine the circumferential and longitudinal strains that should be expected. Use E=20x10e10 Pa and v=0.3

b) A vibrometer is used to measure the time-dependent displacement of a machine vibrating with the motion $y=0.5\sin(31\pi t) + 0.8\sin(10\pi t)$; where Y is in cm and t is in s. If the vibrometer has an updamped natural frequency of 1 Hz and a critical damping ratio of 0.65, determine the vibrometer time-dependent output and explain any discrepancies between the machine vibration and the vibrometer readings.

16 a) Sketch different geometric shapes of moving and fixed anvils in the micrometer.

b) A temperature probe has a time constant of 10 s when used to measure a particular gas flow. The gas temperature varies harmonically between 75^0C and 300^0C with a period of 20s (i.e., with a frequency of 0.05 Hz). What is the temperature readout in terms of the input gas temperature? What time constant should the probe have to give 99% of the correct temperature amplitude?

17 a) Explain with sketch the working of Gear Test for single flank test. What are parameters studied by this test.

b) Explain **i)** Law of intermediate temperatures and **ii)** Law of intermediate materials Thermocouple construction.

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Code No. 2707/CBCS/BL

FACULTY OF ENGINEERING

B.E. VI – Semester (AE) CBCS)(Backlog) Examination, November 2020

Subject: Production Technology

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

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

PART – A (5x2 = 10 Marks)

1. What are the functions of binders and additives in moulding sand?
2. List out the sand properties of moulding sand.
3. 5. Differentiate between soldering and brazing.
4. List out the welding defects.
5. State the advantages of cold working over hot working.
6. What are the functions of flash and gutter in forging?
7. Define rake angle and relief angle.
8. What are the types and functions of chip breakers in metal cutting?
9. What do you understand by centerless grinding?
10. Define machinability. How metals are rated?

PART – B (4x15=60 Marks)

11. (a) Explain the investment casting process with a neat sketch.
    (b) What is shrinkage cavity? What are various tests to find out shrinkage cavity in the casting? Explain about them briefly.
12. (a) Explain the principle, advantages, limitations and applications of GMAW process.
    (b) Explain the principle of friction welding and mention its advantages, limitations and applications.
13. (a) Explain about the following in brief: 1. Bending 2. Deep drawing.
    (b) Explain the principle and applications of planetary rolling mill with neat sketch.
14. (a) Discuss the tool nomenclature of single point cutting tool.
    (b) Define tool life. What are the factors effecting too life.
15. (a) How the taper-turning is done on lathe machine? Explain with sketches.
    (b) Explain working mechanism of shaping machine with a neat sketch.
16. (a) Derive Merchant's first shear angle solution?
    (b) Explain shell moulding process and mention application of this process.
17. Explain the following i) Honing, ii) Burnishing and iii) Gear shaping.

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Code No. 2720/CBCS/BL

FACULTY OF ENGINEERING

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

Subject: Computer Networks & Programming

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

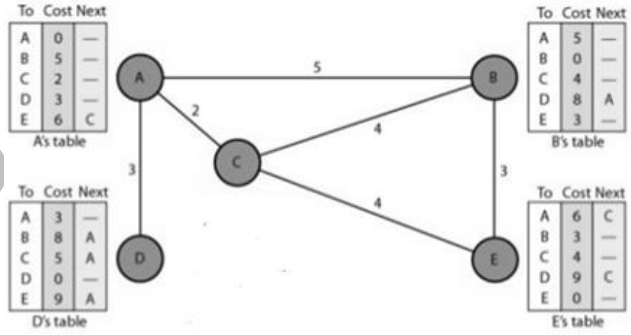
Note: Answer any five questions from Part-A and any four questions from Part-B

PART – A (5x2 = 10 Mark)

1. What is a Protocol and show their relationship with a diagram.
2. List the four parameters that characterize a Flow.
3. State the parameters on which networks can be differentiated.
4. What are the different routers used in OSPF with a neat diagram.
5. What are the different timers used in TCP.
6. State the purpose of UDP pseudo header.
7. Describe the fields of DNS Resource Record.
8. Mension URI and URN.
9. Differentiate between Little Endian and Big Endian representations.
10. List the three steps a process needs to do for Asynchronous I/O.

PART – B (4x15=60 Marks)

11. (a) Differentiate between Virtual Circuit and Datagram network.
    (b) Using Distance Vector Routing algorithm compute the routing table for router C.



12. (a)Draw the IPv4 Header to scale and explain the fields.
    (b) Explain Address Resolution Protocol with a suitable example.
13. (a) Describe different client and server strategies for crash recovery in transport layer.
    (b) Explain the steps in RPC with a neat diagram.
14. (a) Describe DNS Name resolution approaches with a suitable example.

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(b) Explain the basic architecture of Email system and state the purpose of SMTP, MIME, IMAP AND POP3 protocols.

15. (a) Using a diagram, show and explain the usage of elementary socket system calls used in connectionless communication protocols.

(b) Explain the following advanced system calls.

(i) readv and writev (ii) getpeername (iii) select (iv) getsockopt

16. (a) Explain with the aid of timing diagrams connection release in transport layer.

(b) Explain how congestion management is done in TCP.

17. Write short notes on the following:
(a) IP Multicasting.
(b) Internet Super Server **inetd**.
(c) Reverse Path Forwarding.

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Code No. 2727/CBCS/BL

FACULTY OF ENGINEERING
B.E. 4/4 (I.T.) VI-Semester (CBCS)(Backlog) Examination, November 2020

Subject : Embedded Systems

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

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

PART – A (5x2 = 10 Mark)

1 Define Embedded systems and give its applications.
2 Define Counters and Timers.
3 Write Rotate and Swap operations in 8051.
4 Differentiate asynchronous and synchronous type of serial data transmissions.
5 What is interrupt? How is it serviced?
6 List the features of I2C bus protocol.
7 What are interrupts routines in RTOS.
8 Write about mail boxes and Pipes.
9 Differentiate between Hard real-time scheduling and soft real - time scheduling.
10 What are different components in SoC?

PART – B (4x15=60 Marks)

11 (a) Explain the levels of abstraction in Embedded System design process.
(b) Write short notes on serial port programming and also explain SBUF and SCON registers.

12 (a) Explain the Register Structure in 8051.
(b) Explain data transfer instructions in 8051. Discuss addressing modes supported by it .

13 Describe how ADC can be interfaced to 8051 micro-controller along with a diagram.

14 (a) Explain the memory access instruction of ARM Instruction set with example for each.
(b) Explain CAN bus protocol

15 Write short notes on the following:
(a) Home appliance sensors
(b) Sensors for manufacturing
(c) Sensors for environmental monitoring

16 Describe the memory management functions of μCos-II.

17 (a) Explain Processor architectures in SoC.
(b) Discuss memory and addressing in SoC.

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Code No.2131 / BL

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (Backlog) Examination, November 2020

Subject : Structural Engineering Design and Detailing – I (RCC)

Time : 2 hours **Max. Marks : 75**

Note: Answer any seven questions from Part-A. Answer any two questions from Part-B.

PART – A (7x5=35 Marks)

1 Describe any three differences between cantilever and counter fort retaining walls.
2 Explain the advantages of combined footing.
3 What are equations of the impact factor.
4 Define the dome. Where do we provide?
5 Explain in which design pigeaud's curves are used. Give the formula with notation for finding B.M. in short and long directions using Pigeaud's curves.
6 Explain one way shear and two way shear in footings with a neat sketch.
7 Sketch the reinforcement details of a cantilever retaining wall.
8 Explain with a sketch the forces acting on the conical dome of an Intze tank.
9 Explain what is design shear forces and design bending moments.
10 What are permissible stresses required for the design of water tanks.

PART – B (2x20=40 Marks)

11 Design a combined footing for the two columns of a multistoried residential building using the following data:
Size of the column = 530 mm x 530 mm
Axial load on each column = 900 kN
Spacing of the column = 4m c/c
SBC of the soil = 290 kN/m^2
Materials used = M30, Fe500 grade steel

12 Design a retaining wall for the following data:
Height of fill retained by wall = 7m,
Surcharge angle = 12^0,
Density of the soil = 18 kN/m^3,
Angle of internal friction = 32^0,
Coefficient of friction between soil and base slab = 0.40,
SBC of the soil = 250 kN/m^2
Materials used = M 25, Fe 500 grade steel.

13 a) Design rectangular R.C water tank of Size 3.5m x 5 m to retain water to a height of 2.5 m including free board, the tank is resting on the ground. Use M30 concrete and Fe 500 steel.
b) Sketch the reinforcement details.

14 a) Design a circular tank of 4m diameter to retain water to a height of 3.0 m excluding free board. The tank is resting on the ground with all flexible joints.
b) Sketch the reinforcement details.

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15 An RCC deck slab bridge is to be constructed over a trapezoidal channel of 6.0m base width and side slopes 1:1 laid at a bed slope of 0.35 m / km. Design the slab bridge with the following information:

Chevy's constant : 70
Bed Level of stream : 80m
Full supply level : 101 m
Bottom level : 85 m
Materials : M 25 concrete & Fe 500 grade steel
Loading : IRS class – AA (Tracked vehicle)
Road width : 7.0 m
Foot path: 780 mm on either side

16 Design the reinforced concrete slab of an RC T-beam & slab deck using the following data:

Spacing of the main T-beam = 3.0m
Span of the T-beam = 14m
Type of loading : IRC class AA tracked vehicles, no cross girders have been used.
Materials : M25, Fe500 grade steel.

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Code No. 2139/BL

FACULTY OF ENGINEERING

B.E. 3/4 (EE / Inst.) II – Semester (Backlog) Examination, November 2020

Subject: Microprocessor and Microcontrollers

Time: 2 Hours **Max.Marks: 75**

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1 Write the functions of BIU in 8086 microprocessors.
2 List out the difference between microprocessor and microcontroller.
3 What is address and data size in 8086 microprocessor?
4 Define 'Macros' with an example.
5 Explain DDA, AAA instructions.
6 Write the Advantages of Segmentation.
7 Compare Maskable and Nonmaskable interrupts.
8 Draw the BSR mode frame format.
9 Mention the interrupt priority in 8051.
10 Define baud rate of 8051.

PART – B (3x18 = 54 Marks)

11 Draw the pin diagram of 8086 microprocessor and explain the function of each pin in detail.

12 a) List out the different instruction set of 8086 Microprocessor and explain with examples.

b) Explain the concept of segmental memory. What are the advantages?

13 a) Draw the register organization of 8086 microprocessor and explain it.
b) Draw and explain the read and write cycle timing diagrams of 8086 in maximum mode.

14 a) Explain about the mode 2 operation used in 8255 PPI.
b) Write an 8086 ALP to find the sum of numbers in the array of 10 elements.

15 Draw and explain the following SFRs:
a) IE b) IP

16 List out the different instruction set of 8051 microcontroller and explain with examples.

17 a) Draw the Timer / Counter control logic diagram in 8051 microcontroller.
b) What is an interrupt? List the interrupt sources of 8051?

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Code No: 2151/O/BL

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II-Semester. (Old) Examination, November 2020

Subject: Computer Organization & Architecture

Time: 2 hours ***Max. Marks: 75***

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1. Distinguish between micro operation and micro instruction.
2. Explain the use of following registers:
   i) PC ii) DR iii) IR
3. Differentiate between single precision and double precision IEEE standard floating point format representations.
4. Show the hardware implementation for integer binary division operation.
5. What are the basic differences between a branch instruction, a call subroutine instruction and program interrupt?
6. Compare and contrast Hardwired vs. Micro programmed control unit.
7. Why handshake is required between CPU and I/O devices?
8. What is the difference between isolated I/O and memory mapped I/O.
9. What do you mean by a page fault? Which hardware is responsible for detecting the page fault?
10. Draw the space-time diagram for a six-segment pipeline showing the time it takes to process eight tasks.

PART-B (3x18=54 Marks)

11. a) Using booth's multiplication algorithm, multiply (+15) × (-13) showing all the steps. Assume 5-bit registers that hold signed numbers.
    b) What is dividend alignment and why do we use it while performing division operation of binary numbers?

12. a) With neat diagram of a common bus system, show how to execute the Micro-operation AC ← AC + DR
    b) List the control functions and micro-operations needed for the execution of the following instructions and explain.
       i) ADD ii) BSA

13. a) Write the need for addressing modes. Explain various addressing modes supported by a general purpose CPU.
    b) What is the purpose of micro program sequencer? Explain with a block diagram, how the sequencer presents address to control memory?

14. a) Draw the block diagram of an asynchronous communication interface and explain its operation.
    b) Describe in detail how data is transferred in DMA. Draw the necessary diagrams to support your explanation.

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15. a) A non-pipeline system takes 50ns to process a task. The same task can be processed in a six-segment pipeline with a clock cycle of 10ns. Determine the speedup ratio of the pipeline for 100 tasks. What is the maximum speedup that can be achieved?
    b) Explain instruction pipeline conflicts and their remedies.

16. a) Why page-table is required in a virtual memory system? Explain different ways of organizing a page table.
    b) How many 128 × 8 memory chips are needed to provide a memory capacity of 4096 × 16? Give the circuit diagram of the memory using the memory chips.

17. Write short notes on any **Two** of the following:
a) Cache memory
b) Accumulator based CPU organization
c) Various phases of interrupt cycle in basic computer

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Code No. 2150/BL

FACULTY OF ENGINEERING

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

Subject: Microprocessor and Microcontroller

Time: 2 Hours **Max.Marks: 75**

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1 What is the significance of Flag register in 8086 and draw its structure?
2 Write the differences between MOV AX, 1234 and MOV AX, [1234].
3 What is an interrupt vector table? Explain NMI interrupt.
4 Distinguish between Memory mapped I/0 and I/0 mapped I/O.
5 Write the differences between Microprocessor and Microcontroller.
6 Explain PO structure of 8051.
7 Draw and explain SCON register of 8051.
8 What is an interrupt? Write the priorities of 8051 interrupts.
9 What are the specifications of stepper motor? Distinguish between unipolar and bipolar stepper motors.
10 Describe the functions of SOC and EOC of DC.

PART – B (3x18 = 54 Marks)

11 a) Write the differences between minimum and maximum mode operation of 8086. Explain the functions each pin in minimum mode of operation.

b) Explain the following instructions of 8086 with an example:
i) XLAT ii) SAR iii) SHR iv) RET

12 a) Explain block diagram of 8254 progammable timer?

b) Explain control word register of 8255 PPI.

13 a) Explain RAM organization of 8051.

b) Explain stack operation of 8051 with an example.

14 a) What is the difference between Timer and Counter? Explain Timer operation of 8051.

b) Explain Interrupt Enable and Interrupt Priority registers.

15 a) Describe DAC interface to 8051 with a neat diagram. Write a program to generate sine waveform using DAC interface to 8051.
b) Explain structure of external memory interface to 8051.

16 a) Write an assembly language program to perform sum of series of 8-bit numbers using 8086 instruction set.

b) Explain the block diagram of 8257 DMA controller.

17 Write any two of the following:

a) Serial Communication port

b) LCD interface to 8051

c) Bit Manipulation Instructions of 8051.

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Code No: 2156/BL

FACULTY OF ENGINEERING

BE 3/4 (Mech./AE) II-Semester (Backlog) Examination, November 2020

Subject: Heat Transfer

Time: 2 Hours **Max. Marks: 75**

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1 Define thermal diffusivity. Explain.

2 Write expression for general heat conduction equation in Cartesian co-ordinates and deduce it to one dimensional steady state condition with no internal heat generation.

3 List out the applications of lumped heat parameter analysis.

4 How to improve the effectiveness of the fin?

5 What is to be understand by the hydrodynamic and thermal boundary layers?

6 Differentiate between free and forced convection.

7 Differentiate between specular and diffuse reflections.

8 Explain the terms absorptivity, reflectivity and transmissivity.

9 Write the expression for LMTD in Counter flow heat exchanger.

10 Explain nucleate boiling phenomena.

PART – B (3x18=54 Marks)

11 A long steel cylinder 12cm in diameter, initially at 20^0C is placed into a furnace at 820^0C with the local heat transfer coefficient h=140 W/m^2 K. Calculate the time required for the axis temperature to reach 800^{o}C. Also calculate the corresponding temperature at a radius of 5.4cm at that time.

12 Derive the expression for temperature distribution and heat transfer in a fin with convection off at the end.

13 (a) Air enters at a temperature of 60^0C and flows through a 2.5 cm diameter tube with a velocity of 0.8m/s. It can be heated either by (a) condensing the steam on its outer surface or (b) By electric resistance heating, calculate the value of heat transfer coefficient in both cases. Assume fully developed flow.

(b) Air at 30^0C flows across a cylinder of 5cm diameter with a velocity of 25m/s. If the surface temperature is maintained at 120^0C, calculate the rate of heat transfer per meter length.

14 Two very long concentric cylinders of diameters $D1$ = 0.2 m and $D2$ = 0.5 m are maintained at uniform temperatures of T_1 =950 K and T_2 = 500 K and have emissivities ε_1 = 1 and ε_2 = 0.7, respectively. Determine the net rate of radiation heat transfer between the two cylinders per unit length of the cylinder.

..2

15 Air having Cp=1.005 KJ/Kg K is used to cool water in a parallel flow heat exchanger. Air enters at 20^0C with a flow rate of 3 Kg/s and water enters at 90^0C at the rate of 1Kg/s. Determine the heat transfer rate and outlet temperatures of hot water and cold air. Assume overall heat transfer coefficient 300W/m^2K and surface area 10 m^2.

16 A long steel cylinder 12cm in diameter and initially at 20^0C is placed into a furnace at 820^0C with the local heat transfer coefficient h=140 W/m^2 K. Calculate the time required for the axis temperature to reach 800^{o}C. Also calculate the corresponding temperature at a radius of 5.4cm at that time.

17 (a) Explain Wein's displacement law of radiation.
(b) Explain the Fouling effects in heat exchanger.
(c) Distinguish between Black body and Gray body.

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Code No: 2161/BL

FACULTY OF ENGINEERING

BE 3/4 (Prod.) II-Semester (Backlog) Examination, November 2020

Subject: CAD / FEM

Time: 2 Hours **Max. Marks: 75**

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1 What is parametric modelling and when it is used?

2 Write short notes on Bezier Curve.

3 What is the application of synthetic surfaces?

4 What is concatenated Matrix?

5 Write the element stiffness matrix for 1D quadratic bar element.

6 Explain the procedure for calculation of stress in a truss element.

7 Express the Hermite shape functions of beam element.

8 Write the D matrix for plane stress and plane strain conditions.

9 Write the formula for shape functions N_1, N_2, N_3& N_4 of quadrilateral element.

10 Derive the consistent mass matrix for bar element.

PART – B (3x18=54 Marks)

11 (a) Explain in detail about parametric representation of Bezier Curve.
(b) Write the differences between parametric and non-parametric curves.

12 (a) Differentiate between B-Rep and C-rep of solid modelling.
(b) What is the need of synthetic surfaces? Enlist different synthetic surfaces.

13 Find the homogeneous concatenated matrix and transformed coordinates when a square [(1, 1), (2, 1), (1, 2) and (2, 2)] is rotated by 90^0 anticlockwise about a line passing through one of its vertex (1, 1) and parallel to x-axis.

14 Calculate the nodal displacements of the truss shown in figure 1. The truss members are subjected to load P. [E= 200 GPa, A= 500 mm^2 for all members].

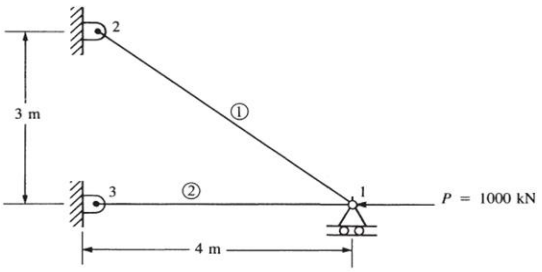


Figure1

..2

15 Determine the deflection and slope at 2m from the left end of the cantilever beam shown in figure2. Take I_1=4 X 10 $^{-6}$m^4; I_2 = 2 X 10^{-6}m^4; E=200 GPa.

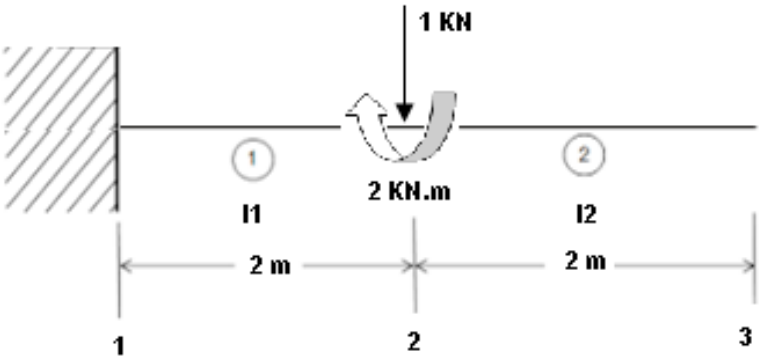
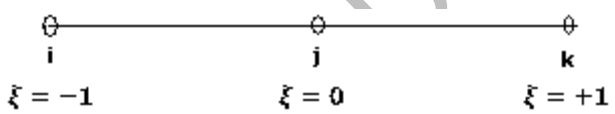


Figure2

16 Evaluate $\int_{\xi=-1}^{+1}[N]^T[N]d\xi$ for following element to illustrate the application of Gaussian quadrature method. [$N_1 = \frac{\xi(\xi-1)}{2}$; $N_2 = (1-\xi^2)$; $N_3 = \frac{\xi(1+\xi)}{2}$].



17 Explain the following:
(a) Different types of synthetic curves
(b) Different type of analytical surfaces
(c) Eigen values and Eigen Vectors

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Code No. 2170/BL

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II – Semester (Backlog) Examination, November 2020

Subject: Object Oriented System Development

Time: 2 Hours **Max. Marks: 75**

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1. What is a state machine?
2. Name Common mechanisms in UML.
3. What are events? Describe kinds of events.
4. What are workflows?
5. Write the stereo types that apply to components.
6. Distinguish between nodes and components.
7. What are Patterns and Frameworks?
8. Name the workers involved in the design workflow.
9. Define 4 Ps. Of Unified Process.
10. What are the common modeling techniques of a class diagram?

PART – B (3 X 14 = 54 Marks)

11. (a) Explain software development life cycle in UML.
    (b) What are object diagrams explain with an example?

12. Analyze the bank ATM system through use case diagrams
13. (a) What are processes and threads?
    (b) Explain how to model interprocess communication and multiple flows of control using processes and threads.
14. What are core workflows? Explain how the requirements are captured as use cases.
15. Explain about
    (a) Modeling the adaptable systems.
    (b) Client Server systems.
16. Explain the following:
    (a) Forward and Reverse Engineering.
    (b) Deployment Diagrams
17. Write short note on the following with an example for each:
    (a) Packages
    (b) State Chart diagrams

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Code No. 2176/BL

FACULTY OF ENGINEERING

B.E. ¾ (IT) II-Semester (Backlog) Examination, November 2020

Subject : Object Oriented System Development

Time : 2 Hours **Max. Marks: 75**

Note: Answer any seven questions from Part-A and any three questions from Part-B

PART – A (7x3=21 Marks)

1 What is the importance of modelling?
2 List the various types of classes with notations.
3 Can a non-human be an actor? Give an example.
4 Contrast an Activity and a state with Representation.
5 Differentiate patterns and frameworks.
6 How does a component differ from an Artifact?
7 How do Development Processes affect people?
8 Are models related to each other? Give an example.
9 What is a Domain model?
10 Why analysis is not Design or Implementation?

PART – B (3x18=54 Marks)

11 Discuss about the conceptual model of the UML.

12 Explain modeling of the following:
(a) Lifetime of an Object
(b) Flow of control by organization

13 Explain modeling of the following:
(a) A Physical Database
(b) An Embedded System

14 Discuss in detail the life cycle of the unified access software Development process.

15 (a) Explain the process of capturing the Requirements as use cases.
(b) What is the role of design in the software life cycle?

16 (a) Differentiate class diagram and an object diagram. Explain with an example.
(b) Explain modeling a family of signals.

17 (a) Why is the unified process said to be use-case driven? Explain.
(b) What is the activity involved to implement a sub-system?

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