

III B. Tech II Semester Supplementary Examinations, November/December – 2016

WATER RESOURCES ENGINEERING–I

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is compulsory3. Answer any **THREE** Questions from **Part-B**

PART -A

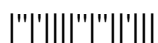
- 1 a) Draw a neat diagram of IS standard non-recording rain gauge. Write the differences between recording and non-recording rain gauges. [4M]
- b) How do you measure infiltration by using infiltrometers? [4M]
- c) Write a brief note on components of runoff. [4M]
- d) What is Maximum probable flood and Standard project flood? [3M]
- e) Define transmissivity, storage coefficient and hydraulic conductivity of an aquifer. [3M]
- f) Define Instantaneous Unit Hydrograph. How does it differ from Unit Hydrograph of finite duration? [4M]

PART -B

- 2 a) Describe briefly the sources of hydrological data in India. [4M]
- b) What is meant by Probable Maximum Precipitation over a basin? Explain how PMP is estimated. [4M]
- c) Explain various methods of determining average rainfall over a basin and discuss the merits and demerits of each method. [8M]
- 3 a) Explain evaporation process. Describe various factors that affect rate of evaporation. [7M]
- b) How do you measure evapotranspiration using a Lysimeter? [4M]
- c) The following are the rates of rainfall in cm/hr for successive 30 minutes period of a 4-hour storm: 2.5, 3.8, 7.0, 10.5, 6.3, 4.7, 3.0, and 2.8. Taking the value of Φ -index as 3.5 cm/hr, find the net runoff in mm, the total rainfall and the value of W-index. [5M]
- 4 a) What is flow duration curve and how is it constructed? What are the uses of flow duration curve. [8M]
- b) The direct runoff hydrograph resulting from a 5 cm of effective rainfall of 6 hours duration is given below. Determine the area of the catchment and the ordinates of 6-h unit hydrograph, [8M]

Time, hr	0	6	12	18	24	30	36	42	48	54	60	66	72
Direct runoff, m ³ /s	0	25	175	320	360	310	230	165	105	60	30	10	0

- 5 a) Describe the method of estimating a T-year flood using Log-Pearson type-III distribution. [8M]
- b) Explain various methods for the control of floods. [8M]



- 6 a) Explain recuperation test and derive the equation used in the test. [8M]
b) A well penetrates fully on 10m thick water bearing stratum of medium sand having coefficient of permeability of 0.005m/s. the well radius is 10cm and is to be worked under a drawdown of 4m at the well face. Calculate the discharge from the well. What will be the % increase in the discharge if the radius of the well is doubled? [8M]
- 7 a) How do you derive Instantaneous Unit Hydrograph from S-curve? [4M]
b) Describe any one hydrological model. [6M]
c) Explain Clark's conceptual model. [6M]



III B. Tech II Semester Supplementary Examinations, November/December-2016

POWER SYSTEM ANALYSIS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

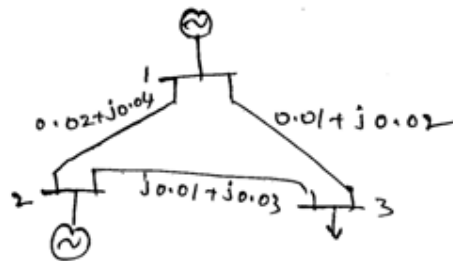
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

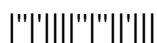
- 1 a) Define the bus incidence matrix
- b) What is the necessity of load flow solution
- c) What are the four ways of adding impedance to an existing system so as modify Z_{bus} matrix
- d) How do you get the short circuit kVA from p.u impedance
- e) When the system is unbalanced
- f) What are the essential factors affecting the stability

PART -B

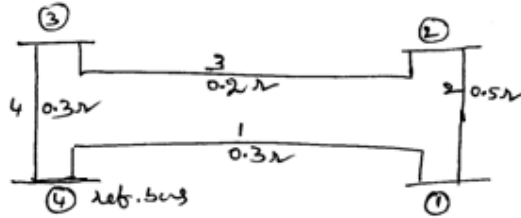
- 2 a) Discuss how to form Y_{Bus} by direct inspection with a suitable example
- b) A 50kW, three phase, Y connected load is fed by a 210kVA transformer with voltage rating 11kV/415V through a feeder. The length of feeder is 1km and the impedance of the feeder is $(0.25+j 4)$ ohm/km. If the load power factor is 0.8. Determine the p.u impedance of the feeder and load.
- 3 The power system network shown in below network, obtain V_3 using N-R method after first iteration. The impedance values in p.u indicted in the network.



Bus code	$ V $	Generation		Load	
		MW	MVAR	MW	MVAR
1	1.05	-	-	-	-
2	1.02	10		7.5	7
3	1.0	0	0	30	15



4 Given the network shown in below figure



Its Z_{Bus} is follows

$$Z_{Bus} = \begin{bmatrix} 0.23 & 0.11 & 0.07 \\ 0.11 & 0.21 & 0.18 \\ 0.07 & 0.18 & 0.23 \end{bmatrix}$$

If the line '2' is removed, determine the Z_{Bus} for the changed network.

- 5 a) What is the importance to study the short circuit analysis? Discuss the possible causes of short circuits in the power system
- b) Determine short circuit MVA at the bus bars of a generating station 500 MVA and other station is 200 MVA. The generated voltage of each station is 12 kV. Also find the possible short circuit MVA at each station when they are linked by an inter connected cable with a reactance of 0.6Ω
- 6 a) What is a 3-Phase unsymmetrical fault? Discuss the different types of unsymmetrical faults that occur in a 3-Phase system
- b) A 30 MVA, 3- ϕ alternator, having its neutral solidly grounded is operating at no load, its voltage being 13.2 kV between lines. It has a reactance to positive sequence currents of 3Ω , the reactance's to negative and zero sequences currents are 90% and 40% of the positive sequence value respectively. For a double line to ground fault, determine i) the currents in the faulty lines, ii) the current through ground and iii) the voltage of healthy phase to neutral.
- 7 a) Explain the latest methods to improve the transient state stability
- b) A generator with constant excitation supplies 35MW through a step up transformer and a high voltage line to an infinite bus bar. If the steady state stability limit of the system is 60MW, determine the maximum permissible sudden increase of generator output (resulting from sudden increase prime mover output) if the stability is to be maintained. Assuming resistance of generator, lines and transformers are neglected.

2 of 2



Code No: RT32034

R13

SET - 1

III B. Tech II Semester Supplementary Examinations, November/December - 2016
ROBOTICS

(Mechanical Engineering)

Time: 3 hours

Maximum Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) What are the advantages of Robot when compared with NC Machine Tool? [3M]
b) What are the different parts of robotic arm? Explain. [4M]
c) What are the properties of Homogenous Transformation Matrix? [4M]
d) Draw the Block diagram of Jacobian Forward differential Motion Model. [4M]
e) What are the different interpolations used for Robot Programming? [4M]
f) Explain the working principle of Pneumatic actuators. [3M]

PART -B

- 2 a) Write some applications of robots. What do you think of future of robots? [8M]
b) Define Automation. Discuss the reasons for automating the existing mechanized units. [8M]
- 3 a) With the help of line diagram, explain basic components of a Robot system. [8M]
b) With neat sketch, explain Robot Architecture. [8M]
- 4 Describe about Inverse and Backward analysis of serial SCARA (PRRRP) Robot. [16M]
- 5 For R-P-R arm manipulator, obtain Jacobian to express the Cartesian velocities in terms of Joint velocities. [16M]
- 6 a) Explain in detail about the Trajectory for cubic polynomials. [8M]
b) Discuss different features of Trajectory planning in Robots & their significance. [8M]
- 7 a) With neat sketches, explain velocity sensors used in Robots. [8M]
b) Discuss in detail about the design of Remote centered devices used for Assembly Operation. [8M]



III B. Tech II Semester Supplementary Examinations, November/December - 2016

MICROWAVE ENGINEERING

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

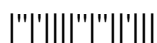
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is compulsory3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Derive the expression for cut-off frequency of a rectangular wave guide. [4M]
 b) What are the design considerations for a micro strip line? [3M]
 c) Explain scattering parameters in microwave components. [4M]
 d) Explain the bunching process in reflex klystron. [4M]
 e) Explain any two applications of magnetron. [3M]
 f) Explain RWH theory. [4M]

PART -B

- 2 a) Derive the wave equation for a TE wave and obtain all the field components in a rectangular waveguides. [8M]
 b) A hollow rectangular waveguide has dimensions $a=1.5$ cm, calculate the amount of attenuation if the frequency of the signal is 6GHz. [8M]
- 3 a) A rectangular-cavity resonator has dimensions of $a=5$ cm, $b=2$ cm and $d=15$ cm, compute. i)the resonant frequency of the dominant mode for an air-filled cavity. [10M]
 ii)the resonant frequency of the dominant mode for a dielectric-filled cavity of $\epsilon_r=2.56$
 b) Define a reentrant cavity and give at least two examples. Where are these used? [6M]
- 4 a) Explain briefly about circulators and isolators. [8M]
 b) Find the Hybrid ring S-parameters and explain with neat sketch. [8M]
- 5 a) A two-cavity amplifier klystron has the following parameters beam voltage $V_0=900$ V, beam current $I_0=30$ mA, frequency $f=8$ GHz, gap spacing in either cavity $d=1$ mm, spacing between centers of cavities $L=4$ cm, effective shunt impedance $R_{sh}=40$ K Ω , determine [10M]
 i)The electron velocity ii)The dc electron transit time iii)The input voltage for maximum output voltage iv)The voltage gain in decibels.
 b) Derive the output power of Two-cavity klystron amplifier. [6M]
- 6 a) Explain the modes of resonance and PI mode operation. [8M]
 b) Explain 8-cavity cylindrical travelling wave. [8M]
- 7 a) Draw and explain in detail about IMPATT diode. [8M]
 b) Draw a neat diagram of a microwave bench setup and explain in detail about all the components. [8M]



III B. Tech II Semester Supplementary Examinations, November/December - 2016
DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE and IT)

Time: 3 hours

Max. Marks: 70

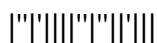
Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answering the question in **Part-A** is compulsory
 3. Answer any **THREE** Questions from **Part-B**

PART -A

- | | | |
|---|---|------|
| 1 | a) What are the characteristics of an algorithm? | [3M] |
| | b) Define Divide & Conquer Strategy. | [3M] |
| | c) Explain about single source shortest path problem. | [4M] |
| | d) Differentiate between greedy method and dynamic programming. | [4M] |
| | e) Define graph coloring | [4M] |
| | f) Explain about Branch and Bound method. | [4M] |

PART -B

- | | | |
|---|---|------|
| 2 | a) Compare time complexity with space complexity? | [8M] |
| | b) Write the pseudo code for expressing algorithms. | [8M] |
| 3 | a) Write and explain recursive binary search algorithm. | [8M] |
| | b) Derive the time complexity of merge sort. | [8M] |
| 4 | a) Write with an example of Prim's algorithm. | [8M] |
| | b) Write a greedy algorithm for sequencing unit time jobs with dead lines and profits. | [8M] |
| 5 | a) Explain Optimal Binary Search tree. | [8M] |
| | b) Solve the following instance of 0/1 Knapsack problem using Dynamic programming
$n = 3; (W_1, W_2, W_3) = (3, 5, 7); (P_1, P_2, P_3) = (3, 7, 12); M = 4.$ | [8M] |
| 6 | a) Discuss Sum of subset problem. | [8M] |
| | b) Discuss about n-queen problem. | [8M] |
| 7 | a) Explain FIFO Branch and Bound solution. | [8M] |
| | b) Explain 0/1 Knapsack problem with respect to branch and bound method. | [8M] |



Code No: **R32014**

R10

Set No. 1

III B.Tech II Semester Supplementary Examinations, November/December-2016

WATER RESOURCES ENGINEERING-II

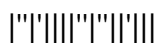
(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Explain with help of a diagram, the various component parts, along with their functions of a diversion headwork.
b) Discuss briefly Khosla's method of independent variable.
- 2 a) What do you understand by mass inflow curve and how is it prepared.
b) Explain how would you determine safe yield from a reservoir of a given capacity.
- 3 What do you understand by the elementary profile of a gravity dam, ?Derive expression for determining base width of such a dam based on (i)Stress criterion ,and (ii)Sliding criterion.
- 4 a) What are the different types of earth dams? Support your answer with neat sketches.
b) Discus in brief the causes of failure of earth dams.
- 5 a) Compute the discharge over an ogee spillway with a coefficient of discharge $C = 2.5$ at a head of 4m. The effective length of the spillway is 100m. Neglect the velocity of approach.
b) Explain with neat sketches different types of spillways gates.
- 6 a) Discuss design principles of Sarda type fall,
b) Write a short note on notch fall.
- 7 a) What do you understand by flexibility of an outlet/ Derive an expression for the same?
b) What are the various functions of head regulator and cross regulator?
- 8 a) Explain the method of determining uplift pressure on the roof of a siphon aqueduct.
b) Describe with the help of neat sketches the various types of cross drainage works.



Code No: **R32024**

R10

Set No. 1

III B.Tech II Semester Supplementary Examinations, November/December-2016

MICROPROCESSORS AND MICROCONTROLLERS

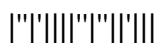
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
All Questions carry equal marks**

- 1 a) Explain the physical memory organization of 8086 microprocessor. [9M]
b) Find the physical addresses for the following values of CS and IP registers [6M]
 - i) CS=2000 and IP=1200
 - ii) CS=3000 and IP=2420
 - iii) CS=1250 and IP=3456
- 2 a) Differentiate between minimum and maximum modes of operation of 8086. [6M]
b) Explain the minimum mode operation of 8086 microprocessor with neat timing diagrams. [9M]
- 3 a) What is an assembler? Explain its use. [4M]
b) What are assembler directives? Discuss different assembler directive of 8086. [8M]
c) Define and explain a Macro. [3M]
- 4 What are the advantages of programmable peripheral interface? Draw and discuss the architecture of 8255. Also discuss different modes of operation. [15M]
- 5 a) What is a DMA controller? Explain the interfacing of 8257 with 8086 microprocessor. [8M]
b) Discuss the output (display) mode of operation of 8279 chip. [7M]
- 6 Differentiate between microcontroller and microprocessor? With a neat diagram, explain the internal architecture of 8051 microcontroller. Also list different applications of microcontrollers. [15M]
- 7 a) What are addressing modes? Discuss different addressing modes of 8051 microcontroller with two examples each. [8M]
b) List and explain different data transfer instructions of 8051 microcontroller with suitable examples. [7M]
- 8 a) What are Digital to Analog converters? Explain its use. [7M]
b) Explain the interfacing of LEDs to 8051 microcontroller. [8M]



Code No: R32034

R10

Set No. 1

III B.Tech. II Semester Supplementary Examinations, November/December-2016

INSTRUMENTATION & CONTROL SYSTEMS

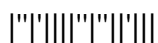
(Common to Mechanical Engineering & Automobile Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
All Questions carry equal marks**

- 1 a) Discuss in detail about the classification and elimination of error. [8M]
b) Explain the basic principle of measurements. [7M]
- 2 a) Differentiate between piezo electric, inductive, capacitance type transducers. [8M]
b) Discuss about expansion, electrical resistance type measuring of temperature. [7M]
- 3 a) Discuss in detail about thermal conductivity gauges. [7M]
b) What is a manometer? Explain the working principle of differential U- Tube manometer with a neat sketch. [8M]
- 4 a) Explain magnetic type level indicator. [7M]
b) Discuss about Rota meter with neat sketch. [8M]
- 5 a) Discuss in detail about electrical tachometers. [10M]
b) What are the mechanical methods to measure the vibrations explain with neat sketches. [5M]
- 6 Derive the expression of output from following types of strain bridges. Assume that the bridges are equiarmed. [15M]
(i) Quarter bridge (ii) Full bridge.
- 7 a) Discuss about pneumatic cells with neat sketch. [8M]
b) Discuss about torque measuring methods using strain sensors. [7M]
- 8 Classify the elements in control system. Explain about position control systems with neat sketch. [15M]



Code No: **R32044**

R10

Set No.1

III B. Tech II Semester Supplementary Examinations, November/December-2016

MICRO PROCESSORS AND MICRO CONTROLLERS

(Common to ECE, ECM, BME, EIE)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
All Questions carry equal marks**

- 1 a) Draw the block diagram of 8086 and explain BIU and EU. [8M]
b) Draw and explain the 8086 timing diagram during the write and read operation. [7M]
- 2 a) Explain the stack operation of 8086. [8M]
b) Write a program that counts the number of 1s in a binary number. [7M]
- 3 a) Explain A/D converter interface to 8086 microprocessors. [10M]
b) What are the differences between static RAM and dynamic RAM. [5M]
- 4 a) Explain the synchronous and asynchronous data transfer methods in 8251USART. [7M]
b) Explain ADC 0809 with neat sketch. [8M]
- 5 a) Explain internal architecture of 80386. [10M]
b) Write about instruction set of 80386. [5M]
- 6 a) Explain addressing modes of 8051 microcontroller. [8M]
b) Explain the salient features of the 8051 microcontroller. [7M]
- 7 a) Discuss i/o ports and timers of PIC microcontroller. [8M]
b) Discuss the PIC 16F8XX Flash controllers. [7M]
- 8 a) Give overview of 16/32 Bit processors. [7M]
b) Discuss ARM / Thumb programming model. [8M]

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