

# AR16

**CODE:** 16CE2007

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February-2021**

**HYDRAULICS AND HYDRAULIC MACHINERY**

**(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

1. a) The time period (t) of a pendulum depends upon the length (L) of the pendulum and acceleration due to gravity (g). Derive an expression for the time period. 7 M
- b) Analyze the procedure for solving the problems by Buckingham's  $\pi$  theorem. 7 M

**(OR)**

2. a) Find an expression for the power P, developed by a pump when P depends upon the head H, the discharge Q and specific weight w of the fluid. 7 M
- b) Analyze using Buckingham's  $\pi$  theorem, the velocity through a circular orifice is given by  $V = \sqrt{2gH} \phi \left[ \frac{D}{H}, \frac{\mu}{\rho V H} \right]$ , where H is the head causing flow, D is the diameter of the orifice,  $\mu$  is co-efficient of viscosity,  $\rho$  is the mass density and g is the acceleration due to gravity. 7 M

## UNIT-II

3. a) Derive an expression for the discharge through open channel by Chezy's formula. 7 M
- b) Find the velocity of flow and rate of flow of water through a rectangular channel of 6 m wide and 3 m deep, when it is running full. The channel is having bed slope as 1 in 2000. Apply Chezy's constant C= 55. 7 M

**(OR)**

4. a) Find the discharge through a trapezoidal channel of width 8 m and side slope of 1 horizontal to 3 vertical. The depth of flow of water is 2.4 m and value of Chezy's constant, C= 50. The slope of the bed of the channel is given 1 to 4000. 7 M
- b) Derive the general equation for the most economical section of channels. 7 M

## UNIT-III

5. a) Derive the expression for the force exerted by the jet on a stationary vertical plate. 7 M
- b) A jet of water of diameter 50 mm strikes a fixed plate in such a way that the angle between the plate and the jet is  $30^\circ$ . The force exerted in the direction of the jet is 147.1 N. Determine the rate of flow of water. 7 M

(OR)

6. Derive an expression of Force exerted on a curved plate when the plate is moving in the direction of the jet. 14M

**UNIT-IV**

7. a) Enumerate with the help of a neat sketch about a Pelton wheel. 7 M  
b) A Pelton wheel has a mean bucket speed of 10 m/sec with a jet of water flowing at the rate of 700 liters/sec under a head of 30 metres. The buckets deflect the jet through an angle of  $160^\circ$ . Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.98. 7 M

(OR)

8. Detailed comparison between Pelton wheel turbine and reaction turbine. 14M

**UNIT-V**

9. a) Enumerate the details of a centrifugal pump. 7 M  
b) Define and derive efficiencies of centrifugal pump. 7 M

(OR)

10. a) A centrifugal pump delivers water against a net head of 14.5 metres and a design speed of 1000 r.p.m. The vanes are curved back up to an angle of  $30^\circ$  with periphery. The impeller diameter is 300 mm and outlet width is 50mm. Determine the discharge of the pump if manometric efficiency is 95%. 7 M  
b) Find the power required to drive a centrifugal pump which delivers  $0.04 \text{ m}^3/\text{s}$  of water to a height of 20 m through a 15 cm diameter pipe and 100 m long. The overall efficiency of the pump is 70% and co-efficient of friction 'f' = 0.15 in the formula  $h_f = \frac{4fLV^2}{2gd}$ . 7 M

**Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

1. a) Discuss the working principle of induction motor along with necessary diagrams. 7M
- b) The power input to a three phase induction motor is 60KW. The stator losses total 1 KW. Find the total mechanical power developed and the rotor copper loss per phase if the motor is running with a slip of 3%. 7M

**(OR)**

2. a) Discuss the torque-slip and torque-speed characteristics of three phase induction motors. 7M
- b) A 25hp , 6-pole, 50Hz, three phase slip ring induction motor runs at 960 RPM on full load with a rotor current per phase of 35A. Allowing 250W for the copper loss in the short circuiting gear, and 1000W for mechanical losses, find the resistance per phase of the three phase rotor winding. 7M

**UNIT-II**

- 3 Draw the circle diagram of a 15 h.p , 230V, 50Hz ,three-phase slip ring induction motor with a star connected stator and rotor. The winding ratio is unity. The stator resistance is 0.42 ohm/phase and rotor resistance is 0.3 ohm/phase the following are the test readings. 14M
- No-load test: 230V, 9A, 0.2143pf. short circuit test: 115V, 45A, 0.454pf.  
Find (a) starting torque (b) maximum torque (c) maximum power factor  
(d) slip for maximum torque (e) maximum output.

**(OR)**

4. a) Explain any one speed control method for induction motor. 7M
- b) Discuss about Auto-transformer starter with a neat sketch. 7M

**UNIT-III**

5. a) Give the comparisons between cylindrical rotor and salient pole synchronous machines. 6M
- b) Derive the EMF equation of an alternator in terms of pitch and distribution factors. 8M

**(OR)**

6. a) Explain the principle of operation of synchronous machine. 7M
- b) Explain the working of synchronous generator with relevant sketches. 7M

**UNIT-IV**

7. a) Discuss the open circuit and short circuit characteristics of synchronous machines. 8M
- b) Explain the method of finding voltage regulation of an alternator by synchronous impedance method. 6M

**(OR)**

- 8 Explain two reaction theory of salient pole machines with neat sketches. 14M

**UNIT-V**

9. a) Explain the working of synchronous motor. 7M
- b) Explain various starting methods of synchronous motor. 7M

**(OR)**

10. a) Deduce the effects of varying field currents in synchronous motors. 7M
- b) Discuss the phenomenon of hunting and Damping. 7M

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)****II B.Tech II Semester Supplementary Examinations, February-2021****THERMAL ENGINEERING - I  
(Mechanical Engineering)****Time: 3 Hours****Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

1. a) Explain with the help of p-v diagram the loss due to variation of specific heats in Otto cycle? 7M
- b) What is spark advance? Explain how it affects the peak pressure in an IC engine. 7M

**(OR)**

2. a) Derive the expression for air standard efficiency of Otto cycle 8M
- b) Explain about heat loss factor and exhaust blow down. 6M

**UNIT-II**

3. a) Discuss the desirable characteristics of a good combustion chamber for an SI engine. 7M
- b) Discuss the various methods for improving the anti-knock quality of an SI engine 7M

**(OR)**

4. a) Describe the following types of SI engine combustion chambers 8M  
i) Overhead valve type combustion chamber. ii) F-head type combustion chamber
- b) Define the term flame velocity? Explain the influence of different operating parameters on flame propagation in S.I. Engine combustion 6M

**UNIT-III**

5. a) Explain how CI engine fuels are rated? 7M
- b) Explain with a neat sketch of Diesel injection system 7M

**(OR)**

6. a) Name three combustion chambers of indirect - injection type for a C.I. engine 8M
- b) Explain the variables affecting performance characteristics of an C.I engine 6M

**UNIT-IV**

7. A gasoline engine working on four stroke develops a brake power of 20.9 kW. A Morse test was conducted on this engine and the brake power (kW) obtained when each cylinder was made inoperative by short circulating the spark plug are 14.9, 14.3, 14.8 and 14.5 respectively. The test was conducted at constant speed. Find the indicator power, mechanical efficiency and bmep when all the cylinders are firing. The bore of the engine is 75 mm and the stroke is 90 mm. The engine is running at 3000 rpm 14M

**(OR)**

8. A six cylinder, four-stroke gasoline engine having a bore of 90 mm and stroke of 100 mm has a compression ratio 7. The relative efficiency is 55% when the indicated specific fuel consumption is 300 gm/kW h. Estimate (i) the calorific value of the fuel and (ii) corresponding fuel consumption, given that imep is 8.5 bar and speed is 2500 rpm. 14M

**UNIT-V**

9. a) Explain the working of single stage reciprocating air compressor with neat sketch. 8M
- b) Derive the expression for work done when compression is isothermal for a single stage reciprocating air compressor 6M

**(OR)**

10. a) Explain i) Roots blower ii) Vane blower with neat sketches. 8M
- b) Explain the working of axial flow compressor with suitable diagrams 6M

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

**UNIT-I**

1. a) Find the X from the following? 10M
    - i)  $(4F7)_{16} = (X)_8$
    - ii)  $(11011001)_2 = (X)_{10}$
    - iii)  $(367)_8 = (X)_2$
    - iv)  $(110110111)_2 = (X)_{16}$
    - v) Convert 11100111 Gray number into Binary
  - b) Explain the BCD to Excess-3 codes conversion. 4M
- (OR)**
2. a) If A = 57 and B = +38, Represent A and B in 8-bit 2's complement. 8M  
Find i) A+B, ii) A-B using 2's complement method
  - b) Identify the errors in received hamming code is 1010111 if even parity used. 6M

**UNIT-II**

3. a) i. Obtain the dual of the Boolean expression  $AB+A(B+C)+B'(B+D)$ . 6M  
ii. Reduce the Boolean expression.  $B'C'D+(B+C+D)+B'C'D'E$   
iii. Find the complement of Boolean expression.  $AB+(AC)'+(AB)'C$ .
  - b) Realize a 2 input XOR and XNOR gate using minimum number of 2 input NAND gates. 8M
- (OR)**
4. a) Design of a 4-bit Gray to Binary code converter. 6M
  - b) Minimize the given function using K-Map method and implement in a Universal logic.  $F(A,B,C,D) = \sum m(0,1,3,4,7,9,10,13,14,15)$ . 8M

**UNIT-III**

5. a) Design a combinational logic to subtract one bit from the other. Draw the Logic diagram using NAND gates. 6M
- b) Draw the block diagram of BCD adder using two 4-bit parallel binary adders And logic gates. 8M

**(OR)**

6. a) Realize the Full-Adder. 6M
- b) Explain the working of Carry Look- Ahead- Adder. 8M

**UNIT-IV**

7. a) Draw and explain the truth table and Logic diagram of a 1 line to 8 line De multiplexer. 7M
- b) Design a 3 to 8 decoder using 2 to 4 decoder and other required gates 7M

**(OR)**

8. a) Realize the function  $F = \sum m(0,1,2,3,4,10,11,14,15)$  using 8 x 1 mux? 8M
- b) Draw the logic diagram of priority encoder and explain in detail its operation. 6M

**UNIT-V**

9. a) i. Differentiate between Synchronous and Asynchronous sequential circuits. 8M  
ii. With logic diagram explain the operation of a JK flip-flop.
  - b) Explain the procedure in detail for converting D flip-flop into SR flip-flops 6M
- (OR)**
10. a) What are the different types of registers? Explain the Serial Input Parallel Output shift register. 6M
  - b) Design a Mod-6 synchronous counter using J-K flip flops. 8M

# AR16

**CODE: 16CS2009**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February-2021**

**Operating Systems**

**(Common to CSE & IT)**

**Time: 3 Hours**

**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

1. a) What is an Operating System and explain its functions? 7M  
b) Explain the following: 7M  
(i) Multiprogramming  
(ii) Time sharing Vs Time Slicing  
(iii) Batch Vs Interactive

**(OR)**

2. Four batch jobs A thru D arrive for execution at times indicated. Each process has a total CPU time requirement as listed below. 14M

Process	Arrival Time	Run Time
A	2	4
B	3	6
C	4	8
D	5	6

Determine the average turnaround and average waiting times for i) Preemptive SJF ii) Non preemptive SJF iii) FCFS.  
Also Draw the Gantt chart.

## UNIT-II

3. Consider the following snapshot of a system: 14M

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P0	0 0 1 2	0 0 1 2	1 5 2 0
P1	1 0 0 0	1 7 5 0	
P2	1 3 5 4	2 3 5 6	
P3	0 6 3 2	0 6 5 2	
P4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm:

- a) What is the content of the matrix Need?  
b) Is the system in a safe state?  
c) If a request from a process P1 arrives for (0,4,2,0) can request be granted immediately?

**(OR)**

4. What is a semaphore? Explain the bounded buffer problem and how semaphores can be used as a solution to this problem. 14M

### **UNIT-III**

5. a) a) Write short notes on: 7M  
i) Fragmentation ii) Segmentation  
b) What is demand paging and how is it implemented? 7M  
(OR)  
6. a) Distinguish between logical and physical address spaces. 7M  
b) How many page faults would run for the optimal page replacement algorithm, assuming Three frames for the page reference string 1,2,3,4,5,1,2,3,6,5,7,4,7,6,and 5. 7M

### **UNIT-IV**

7. a) Explain sequential and indexed file access methods 7M  
b) Explain in detail the four approaches to free-space management. 7M  
(OR)  
8. a) Explain the file system mounting, with examples. 7M  
b) Discuss directory implementation file sharing. 7M

### **UNIT-V**

9. a) Discuss the various Disk space allocation methods? 7M  
b) Discuss any three Disk scheduling algorithms. 7M  
(OR)  
10. a) What is the disadvantage of the Scan algorithm? Discuss how the C-scan algorithm overcomes the problem. 7M  
b) Discuss Look and C-Look algorithm with an example 7M

# AR13

**CODE: 13CE2007**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February-2021**

**HYDRAULICS AND HYDRAULIC MACHINERY  
(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) What is dimensional homogeneity? What is meant by homogeneous equation?  
b) What are the types of flows in a channel?  
c) Define hydraulic jump? Mention the characteristics of hydraulic jump.  
d) Define relative velocity and whirl velocity?  
e) A turbine is discharging radially at outlet. Draw and explain outlet velocity diagram.  
f) What is the necessity of surge tank in hydro power project?  
g) What is a draft tube? Why is it necessary in the case of reaction turbines?  
h) What are the efficiencies of hydraulic turbines?  
i) Explain working principle of multi stage centrifugal pump.  
j) What are the various losses in a centrifugal pump?

**PART-B**

**Answer one question from each unit**

**[5x12=60M]**

**UNIT-I**

2. a) What are the methods of dimensional analysis? Describe the Rayleigh's method for dimensional analysis.  
b) The pressure difference ' $\Delta P$ ' in a pipe of diameter ' $D$ ' and length ' $L$ ' due to turbulent flow depends on the velocity ' $V$ ', viscosity ' $\mu$ ', density ' $\rho$ ' and roughness ' $K$ '. Obtain expression for  $\Delta P$ .

**(OR)**

3. a) Explain Buckingham  $\pi$ -theorem and its advantages.  
b) Derive on the basis of dimensional analysis suitable parameters to represent the thrust developed by a propeller. Assume that the thrust ' $P$ ' depends upon the angular velocity ' $\omega$ ', velocity of advance ' $V$ ', diameter ' $D$ ', dynamic viscosity ' $\mu$ ', mass density ' $\rho$ ' and elasticity of the fluid medium which can be denoted by the speed of sound in the medium ' $C$ '.

**UNIT-II**

4. a) Derive the conditions for most economical section of a trapezoidal section.  
b) A trapezoidal channel has a bottom width of 6m and side slopes of 2 H : 1 V. If the depth of flow is 1.2 m at a discharge of 10 m<sup>3</sup>/s, compute the specific energy and the critical depth.

**(OR)**

5. a) For a given specific energy, show that maximum discharge in a rectangular channel occurs at the critical depth.  
b) The depth of flow of water at a certain section of a rectangular channel of 2 m wide is 0.3 m. The discharge through the channel is 1.5 m<sup>3</sup>/s. Determine whether a hydraulic jump will occur and if so find its height and loss of energy per unit weight of water.



### **UNIT-III**

6. a) Show that the efficiency of a free jet striking normally as series flat plates mounted on the periphery of a wheel never exceeds 50%.  
b) A jet of water moving at 12 m/s impinges on a concave vane set to deflect the jet through  $120^\circ$ . If the vane is moving at 4 m/s, find the angle of the jet so that there is no shock at inlet. What is the absolute velocity of water at exit in magnitude and direction and the work done per N of water.
- (OR)**
7. Derive an expression of Force exerted on a curved plate when the plate is moving in the direction of the jet.

### **UNIT-IV**

8. a) Differentiate between impulse and reaction turbine.  
b) A pelton wheel is revolving at a speed of 190 rpm and develops 5150 kW when working under a head of 220 m with an overall efficiency of 80%. Determine unit speed, unit discharge and unit power. Find the speed, discharge and power when this turbine is working under a head of 140 m.
- (OR)**
9. a) Derive the expression for the specific speed of a turbine.  
b) The following data pertain to a Kaplan turbine Power available at shaft = 8850 kW, Net head available = 5.5 m, Speed ratio = 2.1, Flow ratio = 0.67, Overall efficiency = 85%. Assuming that hub diameter of the wheel is 0.35 times the outside diameter, determine (i) runner diameter (ii) runner speed.

### **UNIT-V**

10. a) Define and derive the expression for minimum speed for starting a centrifugal pump.  
b) The diameter and width of a centrifugal pump impeller are 50 cm and 2.5 cm. The pump runs at 1200 rpm. The suction head is 6 m and the delivery head is 40m. The frictional drop in suction is 2 m and in the delivery 8 m. The blade angle at out let is  $30^\circ$ . The manometric efficiency is 80% and the overall efficiency is 75%. Determine the power required to drive the pump. Also calculate the pressures at the suction and delivery side of the pump.
- (OR)**
11. a) Explain the performance characteristic curves of centrifugal pumps.  
b) Define and derive efficiencies of centrifugal pump.

Time: 3 hours

Max Marks: 70

## PART-A

ANSWER ALL QUESTIONS

[1x10=10 M]

1. a) Write Mason gain formula.
- b) What is the effect of positive feedback on gain of the system?
- c) What is Synchro pair?
- d) Draw the time response of First order system for step input.
- e) What is the difference between qualitative stability and conditional stability?
- f) What are asymptotes in root locus?
- g) Define Gain margin
- h) What are different frequency response specifications?
- i) What is the necessity of compensator?
- j) What are the advantages of state space analysis?

## PART-B

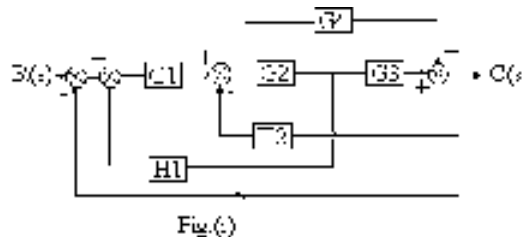
Answer one question from each unit

[5x12=60 M]

### UNIT-I

2. a) Obtain the transfer function  $\frac{C(s)}{R(s)}$  for the block diagram shown in fig.(i) using reduction techniques.

[8M]

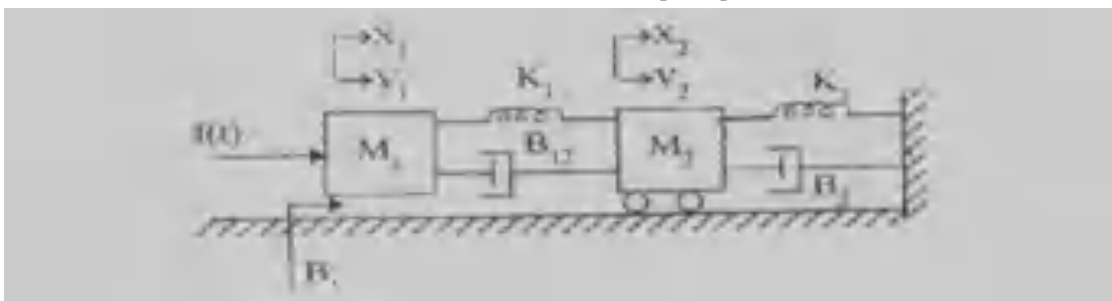


- b) Distinguish between open loop and closed loop system.

[4M]

(OR)

3. Write the differential equations governing the mechanical system given below. Find  $X_1$  (S) / F(S) [12M]



## UNIT-II

4. Sketch the transient response of second order system and derive the expression for rise time, peak over shoot. [12M]

(OR)

5. a) Briefly explain the effect of PI,PD and PID controller. [6M]  
b) Explain the working of Synchro pair. [6M]

## UNIT-III

6. Explain the construction of root loci taking as an example the loop transfer function [12M]  
 $G(S) = K / \{S(S+2)(S+4)\}$

(OR)

7. Apply RH criterion for the equation to determine the stability  $s^4+4s^3+3s^2+3s+k=0$ . Find the range of k for the system to be stable. [12M]

## UNIT-IV

8. Obtain the bode plot for the transfer function  $G(s) = \frac{200}{s(s+2)(s+100)}$ . From the bode plot, obtain the phase margin and gain margin [12M]

(OR)

9. Sketch the polar plot for the open loop system given as  $G(s) = \frac{K}{s(1+0.1s)(1+s)}$ . [12M]  
i) Determine the value of K so that the gain margin is 6db  
ii) Determine the value of K so that the phase margin is  $40^\circ$ .

## UNIT-V

10. a) Explain the properties of state transition matrix  $\phi(t)$  [6M]  
b) Derive the expression for transfer function from state model. [6M]

(OR)

11. For a system described by the state equation  $\dot{X}(t) = AX(t)$ . where  $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$   
determine state transition matrix  $\phi(t)$ . [12M]

**THERMAL ENGINEERING - I  
(Mechanical Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Define Octane and Cetane numbers  
b) What is Scavenging?  
c) What are the advantages of Lubrication in I.C Engines?  
d) Define Super Charging  
e) What is the function of Carburettor?  
f) What is meant by Specific Fuel Consumption?  
g) What do you mean by Choking?  
h) What is the Importance of Heat Balance Sheet?  
i) Define Intercooler  
j) What is meant by Degree of Reaction?

**PART-B****Answer one question from each unit****[5x12=60M]****UNIT-I**

2. a) What is the difference between Air Standard Cycles and Fuel-Air Cycles? [6M]  
b) What is the function of a Carburettor in an S.I Engine? Briefly explain with a neat sketch the Operation of a Simple Float type Carburettor? [6M]
- (OR)
3. a) Draw the theoretical and Actual Value Timing Diagram for 4-stroke CI Engine and discuss in brief the Deviations between the two? [7M]  
b) Explain with a neat sketch the Construction and Working of a Water Cooling System? [5M]

**UNIT-II**

4. a) Explain the difference between i) Pre-ignition ii) Auto-ignition iii) Detonation? [6M]  
b) Discuss about the Basic Requirements of SI Engine Combustion Chambers? [6M]
- (OR)
5. a) What is Ignition Lag? Discuss the Effect of Engine Variables on Ignition Lag? [6M]  
b) Explain different Stages of Combustion in SI Engine? [6M]

**UNIT-III**

6. a) Explain briefly the Applications of CI Engines? [4M]  
b) Differentiate between Direct Combustion Chamber and Turbulent Chamber with suitable examples? [8M]

**(OR)**

7. a) Explain briefly the Phenomenon of “Diesel Knock”? [5M]  
b) Explain about Common-rail Injection system with neat Diagram? [7M]

#### **UNIT-IV**

8. A 4 stroke petrol engine 80 mm bore, 100 mm stroke, is tested at full throttle at constant speed. The fuel supply is fixed at 0.068 kg/min and plugs of the four cylinders are successively short circuited without change of speed, brake torque being correspondingly adjusted. The brake power measurements are the following: With all cylinders firing = 12.5KW, with cylinder No.1 cut off = 9KW, with cylinder No.2 cut off = 9.15KW, with cylinder No.3 cut off = 9.2KW, with cylinder No.4 cut off = 9.1KW. Determine I.P of the engine under these conditions. Also determine the indicated thermal efficiency; C.V of fuel is 44,100 kJ/kg. Compare this efficiency with the air standard value. Clearance volume of one cylinder is  $70 \times 10^3 \text{ mm}^3$ . [12M]

**(OR)**

9. During the test on single cylinder oil engine, working on the 4 stroke cycle and fitted with a rope brake, the following readings are taken: Effective diameter of brake wheel = 630 mm; Dead load on brake = 200 N; Spring balance reading = 30N; Speed = 450r.p.m; Area of indicator diagram =  $420 \text{ mm}^2$ ; Length of indicator diagram = 60mm; Spring scale = 1.1 bar per mm; Diameter of cylinder = 100mm; Stroke = 150mm; Quantity of oil used = 0.815kg/h; Calorific value of oil = 42000KJ/Kg. Calculate brake power, indicated power, mechanical efficiency, brake thermal efficiency and brake specific fuel consumption. [12M]

#### **UNIT-V**

10. a) Classify Air Compressors. Describe the working of a Single Stage Reciprocating Air Compressor? [6M]  
b) Derive the expression for work done when compression is isothermal for a single stage reciprocating air compressor [6M]
- (OR)**
11. a) What is the difference between Rotary and Reciprocating Compressor? [6M]  
b) Explain the working of axial flow compressor with suitable diagrams [6M]

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February-2021**

**SOFTWARE ENGINEERING**

**(Common to CSE & IT)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) Define software engineering
- b) What are the challenges in software?
- c) State feasibility studies
- d) What are object models
- e) What is Software architecture
- f) State various object classes
- g) Explain debugging
- h) What is software quality
- i) Define risk refinement
- j) What is software reviews

**PART-B**

**Answer one question from each unit**

**[5x12=60M]**

**UNIT-I**

- |    |  |    |
|----|--|----|
| 2. | a) Discuss Capability Maturity Model Integration | 6M |
|    | b) What are various Software myths?              | 6M |

**(OR)**

- |    |  |     |
|----|--|-----|
| 3. | Explain the incremental process model with advantages and disadvantages. | 12M |
|----|--|-----|

**UNIT-II**

- |    |  |    |
|----|--|----|
| 4. | a) What are Functional and non-functional requirements | 6M |
|    | b) Explain System requirements                         | 6M |

**(OR)**

- |    |                                     |    |
|----|-------------------------------------|----|
| 5. | a) Explain Requirements elicitation | 6M |
|    | b) What are various Data models     | 6M |

**UNIT-III**

- |    |                                 |    |
|----|---------------------------------|----|
| 6. | a) Explain Architectural Design | 6M |
|    | b) Discuss about Design quality | 6M |

**(OR)**

- |    |                                      |    |
|----|--------------------------------------|----|
| 7. | a) What is design interface analysis | 6M |
|    | b) Explain User interface analysis   | 6M |

**UNIT-IV**

- |    |   |     |
|----|---|-----|
| 8. | What is testing? Explain the different levels of testing. | 12M |
|----|---|-----|

**(OR)**

- |    |  |    |
|----|--|----|
| 9. | a) What are software metrics and measurements? | 6M |
|    | b) Explain Putnam Model                        | 6M |

**UNIT-V**

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| 10. | Explain various risk management concepts in detail | 12M |
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**(OR)**

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|-----|---|----|
| 11. | a) State The ISO 9000 quality standards.    | 6M |
|     | b) Discuss about Software quality assurance | 6M |