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B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2015)

Fourth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U15MET405: Thermodynamics and Fluid Mechanics

COURSE OUTCOMES

CO1: Explain the concepts of thermodynamics and mechanisms of heat transfer.

CO2: Discuss the working of engines, turbines and boilers.

CO3: Describe the working of compressors and air conditioning.

CO4: Apply the concept of Euler and Bernoulli's equation for solving fluid flow problems

CO5: Analyze the performance of various fluid machines

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 1 = 10 Marks)

1. Match List I with List II   CO4 [K_1]

List I	List II
A. dynamic viscosity	i. surface tension
B. capillary rise	ii. momentum transfer
C. kinematic viscosity	iii. liquid
D. free surface	iv. shear stress

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	ii	i
c)	iv	iii	ii	i
d)	iii	i	ii	iv

2. The correct sequence of processes in internal combustion engine is   CO2   [K_1]

   1. Compression   2. Expansion   3. Suction   4. Exhaust

   a)   4-1-2-3   b)   4-3-2-1

   c)   1-3-2-4   d)   3-1-2-4

3. Which of the following is not a specific heat relation

CO1 [K$_1$]

1. $c_p - c_v = R$ 2. $c_{p/} c_{v} = \gamma$ 3. $h = u + pv$

   a)   1,2

   b)   3 only

   c)   2,3

   d)   2 only

4. Kaplan turbine is

CO5 [K$_1$]

   a)   Inward flow radial turbine

   b)   Outward flow radial turbine

   c)   Axial turbine

   d)   Used for high heads

5. Assertion(A): Viscosity of fluids changes with respect to temperature

CO4 [K$_2$]

   Reason (R): viscous forces in fluids are due to cohesive forces and molecular momentum transfer

   a)   Both A and R are Individually true and R is the correct explanation of A

   b)   Both A and R are Individually true but R is not the correct explanation of A

   c)   A is true but R is false

   d)   A is false but R is true

6. Reciprocating pumps are suitable for................. pressures and .... volumes

CO5 [K$_1$]

   a)   High ,low

   b)   Low , High

   c)   Very high, very low

   d)   Very low, Very high

7. The correct sequence of processes in vapour compression refrigeration system is

CO3 [K$_1$]

   1.Compression   2. Expansion   3. Cooling 4. Evaporation

   a)   4-1-2-3

   b)   4-3-2-1

   c)   1-3-2-4

   d)   3-2-1-4

8. DBT is

CO3   [K$_1$]

   a)   Dry bulb temperature

   b)   Dew bulb temperature

   c)   Dry boiling temperature

   d)   Dense bulb temperature

9. Assertion (A):Properties are the coordinates to describe the state of a system

CO1 [K$_2$]

   Reason (R):The succession of states passed through during a change of state is called the path of the change of state

   a)   Both A and R are Individually true and R is the correct explanation of A

   b)   Both A and R are Individually true but R is not the correct explanation of A

   c)   A is true but R is false

   d)   A is false but R is true

10. Impulse blades are

CO2 [K$_1$]

   a)   Symmetrical

   b)   Unsymmetrical

   c)   Used for pressure drop

   d)   Used in reaction turbines

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11.	State second law of thermodynamics	CO1	[K1]
12.	Explain thermodynamic system with examples	CO1	[K1]
13.	Outline the importance of boilers in power generation	CO2	[K1]
14.	Differentiate between SI and CI engines	CO2	[K2]
15.	Compare refrigeration and air conditioning	CO3	[K1]
16.	Why intercooling is needed in compressors?	CO3	[K2]
17.	List the types of flow lines	CO4	[K1]
18.	What are major and minor losses?	CO4	[K1]
19.	Classify pumps	CO5	[K1]
20.	Distinguish between Pelton and Kaplan turbines	CO5	[K1]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	Discuss cooling of electronic components		CO1	[K1]
22.	i)Compare centrifugal and axial flow compressors	(7)	CO3	[K2]
	ii) Derive otto cycle efficiency	(7)	CO2	
23.	Compare four stroke and two stroke SI engines		CO2	[K2]
24.	Compare impulse and reaction turbines using neat sketches		CO2	[K2]
25.	Derive Bernoulli's equation. Also state its applications		CO4	[K2]
26.	Discuss the working of centrifugal pump with neat sketches		CO5	[K2]
27.	Explain vapour compression refrigeration system in detail		CO3	[K2]

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