-					
Reg. No.:					

**Question Paper Code: 51728** 

## B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

## Second Semester

## Mechanical Engineering

## 15UME208 - BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to EEE and EIE branches)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

**Answer ALL Questions** 

PART A -  $(10 \times 1 = 10 \text{ Marks})$ 

1.	In chain pins the arrow	should be made of goo	od quality of hardened	and tempered steel
	wire of minimum tensile	strength of		
	(a) $70 \text{ kg/mm}^2$	(b) $70 \text{ N/mm}^2$	(c) 70 KN/mm <sup>2</sup>	(d) $70 \text{ kg/m}^2$

- 2. The reading taken on the staff held at a point of unknown elevation is known as
  - (a) Foresight (F.S)

(b) Back sight (B.S)

(c) Change point

(d) Intermediate station

- 3. If a beam having its end portion extended beyond the support, it is called
  - (a) Continuous beam

(b) Cantilever beam

(c) Overhanging beam

(d) Simply supported beam

4. A mild steel rod of 12mm diameter and 200 mm length elongates 0.085 mm under an axial pull of 10kN. Determine the young's modulus of the material.

(a)  $2.08 \times 10^{-5} \text{ KN/mm}^2$ 

(b)  $2.08 \times 10^{-5} \text{ KN/m}^2$ 

(c)  $2.08 \times 10^{-5} \text{ N/mm}$ 

(d)  $2.08 \times 10^{-5} \text{ N/mm}^2$ 

(a) 45% (b) 40% (c) 35% (d) 30%  6. 1 eV =  (a) 1.6 X 10 <sup>-13</sup> J (b) 1.6 X 10 <sup>-18</sup> J (c) 1.6 X 10 <sup>-17</sup> J (d) 1.6 X 10 <sup>-19</sup> J  7. Name the material used for making crank shaft.  (a) Aluminum alloy (b) Cast iron (c) Alloys steel (d) Special alloy  8. The inlet value is opened in advance to TDC position enabling the fresh charge to enter.  (a) 15 <sup>0</sup> – 30 <sup>0</sup> (b) 20 <sup>0</sup> – 30 <sup>0</sup> (c) 5 <sup>0</sup> – 30 <sup>0</sup> (d) 10 <sup>0</sup> – 30 <sup>0</sup> 9. Specific heat of ice (Cp ice) =  (a) 2.1 J/kg K (b) 2.1 kJ/kg (c) 2.1 kJ/kg K (d) 2.1 kJ/kg/K  10. One ton of refrigeration =  (a) 233.333 kJ/min (b) 253.333KJ/min (c) 233.333 kJ/min (c) 233.333 kJ/min (d) 2.333 kJ/min (e) 253.333 kJ/min (f) 253.333 kJ/min (h) 253.333 kJ/min	٥.	The effic	enency of the ga	s power plant is		
(a) $1.6 \times 10^{-13}  \text{J}$ (b) $1.6 \times 10^{-18}  \text{J}$ (c) $1.6 \times 10^{-17}  \text{J}$ (d) $1.6 \times 10^{-19}  \text{J}$ 7. Name the material used for making crank shaft.  (a) Aluminum alloy (b) Cast iron (c) Alloys steel (d) Special alloy  8. The inlet value is opened in advance to TDC position enabling the fresh charge to enter.  (a) $15^0 - 30^0$ (b) $20^0 - 30^0$ (c) $5^0 - 30^0$ (d) $10^0 - 30^0$ 9. Specific heat of ice (Cp ice) =  (a) $2.1  \text{J/kg K}$ (b) $2.1  \text{kJ/kg}$ (c) $2.1  \text{kJ/kg K}$ (d) $2.1  \text{kJ/kg/K}$ 10. One ton of refrigeration =  (a) $233.333  \text{kJ/min}$ (b) $253.333  \text{kJ/min}$ (c) $233.333  \text{kJ/min}$ (d) $2.333  \text{kJ/min}$ (e) $233.333  \text{kJ/min}$ (b) $253.333  \text{kJ/min}$ (c) $233.333  \text{kJ/min}$ (d) $2.333  \text{kJ/min}$ (e) $253.333  \text{kJ/min}$ (f) $253.333  \text{kJ/min}$ (e) $253.333  \text{kJ/min}$ (f) $253.333  \text{kJ/min}$ (h)		(a) 4	5%	(b) 40%	(c) 35%	(d) 30%
(c) 1.6 X 10 <sup>-17</sup> J (d) 1.6 X 10 <sup>-19</sup> J  7. Name the material used for making crank shaft.  (a) Aluminum alloy (b) Cast iron (c) Alloys steel (d) Special alloy  8. The inlet value is opened	6.	1 eV =				
(a) Aluminum alloy (b) Cast iron (c) Alloys steel (d) Special alloy  8. The inlet value is opened in advance to TDC position enabling the fresh charge to enter.  (a) 15 <sup>0</sup> – 30 <sup>0</sup> (b) 20 <sup>0</sup> – 30 <sup>0</sup> (c) 5 <sup>0</sup> – 30 <sup>0</sup> (d) 10 <sup>0</sup> – 30 <sup>0</sup> 9. Specific heat of ice (Cp ice) = (a) 2.1 J/kg K (b) 2.1 kJ/kg (c) 2.1 kJ/kg K (d) 2.1 kJ/kg/K  10. One ton of refrigeration = (a) 233.333 kJ/min (b) 253.333 KJ/min (c) 233.333 KJ/min (c) 233.333 KJ/min (d) 2.333 KJ/min  PART - B (5 x 2 = 10 Marks)  11. What do you mean by chain surveying  12. State the advantages and disadvantages of shell roofs.  13. List the four nuclear power plants in India.  14. Differentiate between boiler mounting and boiler accessories.  15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10) (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of		` '				
(c) Alloys steel (d) Special alloy  8. The inlet value is opened in advance to TDC position enabling the fresh charge to enter.  (a) 15° – 30° (b) 20° – 30° (c) 5° – 30° (d) 10° – 30°  9. Specific heat of ice (Cp ice) = (a) 2.1 J/kg K (b) 2.1 kJ/kg (c) 2.1 kJ/kg K (d) 2.1 kJ/kg/K  10. One ton of refrigeration = (a) 233.333 kJ/min (b) 253.333KJ/min (c) 233.333 kJ/s (d) 2.333 KJ/min PART - B (5 x 2 = 10 Marks)  11. What do you mean by chain surveying 12. State the advantages and disadvantages of shell roofs. 13. List the four nuclear power plants in India. 14. Differentiate between boiler mounting and boiler accessories. 15. What are the properties of a good refrigerant? PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10) (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the survey line irregular boundary line, and first and last offsets, by the application of the survey line in the irregular boundary line, and first and last offsets, by the application of the survey line in the irregular boundary line, and first and last offsets, by the application of the survey line in the irregular boundary line, and first and last offsets, by the application of the survey line in the irregular boundary line, and first and last offsets, by the application of the survey line is a survey line in the irregular boundary line, and first and last offsets, by the application of the survey line is a survey line in the irregular boundary line, and first and last offsets, by the application of the survey line is a survey line in the irregular boundary line, and first and last offsets were last and interest and intere	7.	Name the	e material used	for making crank sh	aft.	
charge to enter.  (a) $15^0 - 30^0$ (b) $20^0 - 30^0$ (c) $5^0 - 30^0$ (d) $10^0 - 30^0$ 9. Specific heat of ice (Cp ice) =  (a) $2.1 \text{ J/kg K}$ (b) $2.1 \text{ kJ/kg}$ (c) $2.1 \text{ kJ/kg K}$ (d) $2.1 \text{ kJ/kg/K}$ 10. One ton of refrigeration =  (a) $233.333 \text{ kJ/min}$ (b) $253.333 \text{ kJ/min}$ (c) $233.333 \text{ kJ/min}$ (d) $2.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (g) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (g) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (g) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (g) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (g) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (f) $233.333 \text{ kJ/min}$ (e) $233.333 \text{ kJ/min}$ (f)			•		` ′	
9. Specific heat of ice (Cp ice) =  (a) 2.1 J/kg K (b) 2.1 kJ/kg (c) 2.1 kJ/kg K (d) 2.1 kJ/kg/K  10. One ton of refrigeration =  (a) 233.333 kJ/min (b) 253.333KJ/min (c) 233.333 KJ/s (d) 2.333 KJ/min  PART - B (5 x 2 = 10 Marks)  11. What do you mean by chain surveying  12. State the advantages and disadvantages of shell roofs.  13. List the four nuclear power plants in India.  14. Differentiate between boiler mounting and boiler accessories.  15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of	8.		_	d in ad	vance to TDC position en	nabling the fresh
(a) 2.1 J/kg K (b) 2.1 kJ/kg (c) 2.1 kJ/kg K (d) 2.1 kJ/kg/K  10. One ton of refrigeration =  (a) 233.333 kJ/min (b) 253.333KJ/min (c) 233.333 KJ/s  (d) 2.333 KJ/min  PART - B (5 x 2 = 10 Marks)  11. What do you mean by chain surveying  12. State the advantages and disadvantages of shell roofs.  13. List the four nuclear power plants in India.  14. Differentiate between boiler mounting and boiler accessories.  15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of		(a) 1.	$5^0 - 30^0$	(b) $20^0 - 30^0$	(c) $5^0 - 30^0$	(d) $10^0 - 30^0$
10. One ton of refrigeration =  (a) 233.333 kJ/min (b) 253.333KJ/min (c) 233.333 KJ/s  (d) 2.333 KJ/min  PART - B (5 x 2 = 10 Marks)  11. What do you mean by chain surveying  12. State the advantages and disadvantages of shell roofs.  13. List the four nuclear power plants in India.  14. Differentiate between boiler mounting and boiler accessories.  15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of	9.	Specific	heat of ice (Cp	ice) =		
<ul> <li>(a) 233.333 kJ/min</li> <li>(b) 253.333KJ/min</li> <li>(c) 233.333 KJ/s</li> <li>(d) 2.333 KJ/min</li> <li>PART - B (5 x 2 = 10 Marks)</li> <li>11. What do you mean by chain surveying</li> <li>12. State the advantages and disadvantages of shell roofs.</li> <li>13. List the four nuclear power plants in India.</li> <li>14. Differentiate between boiler mounting and boiler accessories.</li> <li>15. What are the properties of a good refrigerant?</li> <li>PART - C (5 x 16 = 80 Marks)</li> <li>16. (a) (i) With a neat diagram explain Prismatic compass. (10)</li> <li>(ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line, and first and last offsets, by the application of the survey line to an irregular boundary line.</li> </ul>		(a) 2	.1 J/kg K	(b) 2.1 kJ/kg	(c) 2.1 kJ/kg K	(d) 2.1 kJ/kg/K
(c) 233.333 KJ/s  PART - B (5 x 2 = 10 Marks)  11. What do you mean by chain surveying  12. State the advantages and disadvantages of shell roofs.  13. List the four nuclear power plants in India.  14. Differentiate between boiler mounting and boiler accessories.  15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass.  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of	10.	One ton	of refrigeration	=		
<ul> <li>11. What do you mean by chain surveying</li> <li>12. State the advantages and disadvantages of shell roofs.</li> <li>13. List the four nuclear power plants in India.</li> <li>14. Differentiate between boiler mounting and boiler accessories.</li> <li>15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)</li> <li>16. (a) (i) With a neat diagram explain Prismatic compass. (10)</li> <li>(ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets.</li> </ul>		* *				
<ul> <li>12. State the advantages and disadvantages of shell roofs.</li> <li>13. List the four nuclear power plants in India.</li> <li>14. Differentiate between boiler mounting and boiler accessories.</li> <li>15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the regular boundary line, and first and last offsets, by the application of the regular boundary line, and first and last offsets, by the application of the regular boundary line, and first and last offsets, by the application of the regular boundary line.</li> </ul>				PART - B (5 x 2	= 10 Marks)	
<ul> <li>13. List the four nuclear power plants in India.</li> <li>14. Differentiate between boiler mounting and boiler accessories.</li> <li>15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks) </li> <li>16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line.</li> </ul>	11.	What do	you mean by c	hain surveying		
<ul> <li>14. Differentiate between boiler mounting and boiler accessories.</li> <li>15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks) </li> <li>16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line.</li> </ul>	12.	State the	advantages and	d disadvantages of sh	nell roofs.	
15. What are the properties of a good refrigerant?  PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of	13.	List the f	our nuclear pov	wer plants in India.		
PART - C (5 x 16 = 80 Marks)  16. (a) (i) With a neat diagram explain Prismatic compass. (10)  (ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of	14.	Different	tiate between be	oiler mounting and b	oiler accessories.	
<ul> <li>16. (a) (i) With a neat diagram explain Prismatic compass. (10)</li> <li>(ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of the irregular boundary line, and first and last offsets, by the application of the irregular boundary line.</li> </ul>	15.	What are	the properties	of a good refrigerant	?	
(ii) The following perpendicular offsets were taken at 10 meter intervals from a survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m, 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of				PART - C (5 x 16	5 = 80 Marks)	
survey line to an irregular boundary line. 3.15m, 4.3m, 8.2m, 5.6m, 6.85m 7.6m, 4.2m, 5.6m, 4.3m. Calculate the area enclosed between the survey line the irregular boundary line, and first and last offsets, by the application of	16.	(a) (i) V	With a neat diag	gram explain Prisma	tic compass.	(10)
		s 7 t	survey line to 7.6m, 4.2m, 5.6 the irregular be	an irregular bounda 5m, 4.3m. Calculate oundary line, and f	the area enclosed between try line. 3.15m, 4.3m, 8 the area enclosed between try and last offsets, by	8.2m, 5.6m, 6.85m een the survey line the application of

	(b)	(i)	Write a short notes on different types of cement varieties with is advantages and disadvantages. (8)
		(ii)	Write the properties of ordinary Portland cement. (8)
17.	(a)	(i)	What is Stone masonry? And explain its types with neat sketches. (8)
		(ii)	What are the different points to be kept in mind in supervising stone masonry work? (8)
			Or
	(b)	(i)	What do you mean by bridges and state the different classification of bridges? (8)
		(ii)	What are the factors should be considered for the selection of site for the Dam? (8)
18.	(a)	(i)	With a neat sketch explain the construction and working of hydro electric power plant. (10)
		(ii)	Write the factors considered for the site selection of thermal power plant. (6)
			Or
	(b)	(i)	Explain the important components and working principle of centrifugal pump with a neat diagram. (10)
		(ii)	Differentiate between impulse and reaction turbine. (6)
19.	(a)	(i)	Explain briefly about working principle of two stroke gasoline engine with neat sketches. (10)
		(ii)	Differentiate between SI and CI engines. (6)
			Or
	(b)	(i)	With a neat sketch explain about Cochran boiler. (8)
		(ii)	Write a short note on fusible plug and spring loaded safety value. (8)
20.	(a)	(i)	Distinguish between vapour compression and vapour absorption refrigeration

(ii) Explain the construction and working principle of

refrigeration system with neat sketch.

system.

vapour absorption

(6)

(10)

- (b) (i) With a neat sketch explain the construction and working of window type air conditioner with its merits and demerits. (10)
  - (ii) State the merits and demerits of window and split type air conditioner. (6)

\_\_\_\_\_