



# IES (ESE)-2011 Solution, Answer Key

## Mechanical Paper-I

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SET					SET					SET					SET				
Q. No.	A	B	C	D	Q. No.	A	B	C	D	Q. No.	A	B	C	D	Q. No.	A	B	C	D
	Ans.	Ans.	Ans.	Ans.		Ans.	Ans.	Ans.	Ans.		Ans.	Ans.	Ans.	Ans.		Ans.	Ans.	Ans.	Ans.
1	B	C	D	A	31	B	B	A	D	61	D	A	C	B	91	D	B	B	B
2	C	D	D	D	32	C	B	C	B	62	D	A	D	B	92	C	B	B	D
3	D	B	C	A	33	D	C	D	D	63	C	A	B	B	93	D	D	C	C
4	A	B	D	D	34	A	A	C	D	64	D	C	B	A	94	C	D	A	C
5	D	A	B	C	35	B	A	C	A	65	B	B	A	C	95	A	A	A	D
6	A	A	D	B	36	B	A	A	D	66	D	A	A	A	96	B	B	A	D
7	D	D	C	A	37	B	C	C	A	67	C	C	D	D	97	C	D	C	B
8	D	A	A	B	38	B	B	A	D	68	A	D	A	B	98	A	A	B	C
9	B	A	C	C	39	D	C	C	C	69	C	C	A	A	99	A	A	C	B
10	D	B	A	D	40	B	A	A	B	70	A	D	B	C	100	A	A	A	C
11	C	B	B	B	41	A	D	D	C	71	B	A	B	B	101	A	D	A	A
12	D	C	D	B	42	C	D	D	D	72	B	C	C	B	102	D	D	D	A
13	C	D	C	D	43	B	C	A	B	73	C	D	D	C	103	A	A	A	A
14	D	A	C	D	44	C	D	A	B	74	C	C	A	A	104	B	A	B	C
15	C	B	D	A	45	A	B	C	A	75	D	C	B	A	105	C	C	C	B
16	C	B	D	B	46	A	D	C	A	76	D	A	B	A	106	B	C	B	A
17	A	B	B	D	47	A	C	A	D	77	B	C	B	C	107	A	C	A	C
18	A	B	C	A	48	C	A	C	A	78	C	A	B	B	108	B	C	B	D
19	D	D	B	A	49	B	C	D	A	79	B	C	D	C	109	C	D	C	C
20	D	B	C	A	50	B	A	C	B	80	C	A	B	A	110	D	C	D	D
21	C	B	A	B	51	C	B	D	B	81	A	A	B	D	111	B	D	B	A
22	C	B	A	D	52	A	B	B	C	82	C	D	B	D	112	B	B	B	C
23	B	B	A	A	53	B	C	D	D	83	A	A	B	C	113	D	D	D	D
24	B	A	C	A	54	D	C	D	A	84	C	B	A	D	114	A	D	D	C
25	A	C	B	C	55	A	D	A	A	85	A	C	C	B	115	A	A	A	C
26	A	A	A	C	56	C	D	D	B	86	C	B	A	D	116	B	D	B	A
27	D	D	C	A	57	A	B	A	B	87	C	A	D	C	117	D	A	D	C
28	A	B	D	C	58	B	C	D	B	88	D	B	B	A	118	A	D	A	A
29	A	A	C	D	59	B	B	C	D	89	C	C	A	C	119	A	C	A	C
30	B	C	D	C	60	B	C	B	B	90	A	D	C	A	120	A	B	A	A

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# Mechanical Engineering Paper-I

## Explation of SET-A

**33.** Direct Question from HMT book of R K Rajput Question No. 73 Ans. (d)

**42.** Some work can be obtained by expander. So it will decrease irreversibility.

**56.**  $k = -\frac{\Delta p}{\frac{\Delta V}{V}}$  if  $\Delta p \uparrow$  then  $\Delta V \downarrow$  and bulk modulus (k) remains same

**74.** In thixotropic substance a time dependant shear stress is there

$$\tau = \mu \left( \frac{du}{dy} \right)^n + f(t)$$

Where f(t) is decreasing

For Bingham or Ideal plastic fluid

$$\tau = \tau_0 + \mu \left( \frac{du}{dy} \right)^n$$

**96.** Water jet machining used speed of water 1000 m/s which is supersonic.

**117.** The exhaust gases can not be cooled down below a certain temperature. The sulphuric acid dewpoint, to avoid low temperature corrosion. If colled below 100°C some water vapour condenses into liquid droplets which reacts with SO<sub>2</sub> or SO<sub>3</sub> to form acid.

# Explation of SET-B

**13.** Direct Question from HMT book of R K Rajput Question No. 73 Ans. (d)

**25.**  $k = -\frac{\Delta p}{\frac{\Delta V}{V}}$  if  $\Delta p \uparrow$  then  $\Delta V \downarrow$  and bulk modulus (k) remains same

**39.** Some work can be obtained by expander. So it will decrease irreversibility.

**54.** In thixotropic substance a time dependant shear stress is there

$$\tau = \mu \left( \frac{du}{dy} \right)^n + f(t)$$

Where f(t) is decreasing

For Bingham or Ideal plastic fluid

$$\tau = \tau_0 + \mu \left( \frac{du}{dy} \right)^n$$

**65.** Water jet machining used speed of water 1000 m/s which is supersonic.

**97.** The exhaust gases can not be cooled down below a certain temperature. The sulphuric acid dewpoint, to avoid low temperature corrosion. If colled below 100°C some water vapour condenses into liquid droplets which reacts with SO<sub>2</sub> or SO<sub>3</sub> to form acid.

# Explation of SET-C

- 14.** In thixotropic substance a time dependant shear stress is there

$$\tau = \mu \left( \frac{du}{dy} \right)^n + f(t)$$

Where f(t) is decreasing

For Bingham or Ideal plastic fluid

$$\tau = \tau_0 + \mu \left( \frac{du}{dy} \right)^n$$

- 25.** Water jet machining used speed of water 1000 m/s which is supersonic.

- 73.** Direct Question from HMT book of R K Rajput Question No. 73 Ans. (d)

- 85.**  $k = \frac{\Delta p}{\frac{\Delta V}{V}}$  if  $\Delta p \uparrow$  then  $\Delta V \downarrow$  and bulk modulus (k) remains same

- 99.** Some work can be obtained by expander. So it will decrease irreversibility.

- 117.** The exhaust gases can not be cooled down below a certain temperature. The sulphuric acid dewpoint, to avoid low temperature corrosion. If colled below 100°C some water vapour condenses into liquid droplets which reacts with SO<sub>2</sub> or SO<sub>3</sub> to form acid.

# Explation of SET-D

17. The exhaust gases can not be cooled down below a certain temperature. The sulphuric acid dewpoint, to avoid low temperature corrosion. If colled below 100°C some water vapour condenses into liquid droplets which reacts with SO<sub>2</sub> or SO<sub>3</sub> to form acid.
53. Direct Question from HMT book of R K Rajput Question No. 73 Ans. (d)
65.  $k = \frac{\Delta p}{\frac{\Delta V}{V}}$  if  $\Delta p \uparrow$  then  $\Delta V \downarrow$  and bulk modulus (k) remains same
79. Some work can be obtained by expander. So it will decrease irreversidility.
94. In thixotropic substance a time dependant shear stress is there  
$$\tau = \mu \left( \frac{du}{dy} \right)^n + f(t)$$
Where f(t) is decreasing  
For Bingham or Ideal plastic fluid  
$$\tau = \tau_0 + \mu \left( \frac{du}{dy} \right)^n$$
105. Water jet machining used speed of water 1000 m/s which is supersonic.

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Engineering Service Examination-2011