

IAT 1_ Dynamics of Machines

* Required

1. Email address *

2. Enter password *

Instructions

10 marks * 3 = 30 Marks
1 marks * 20 = 20 Marks

3. The four masses A, B, C and D are 100 kg, 150 kg, 120 kg and 130 kg attached to a shaft and revolve in the same plane. The corresponding radii of rotations are 22.5 cm, 17.5 cm, 25 cm and 30 cm and the angles measured from A are 450, 1200 and 2550. Find the magnitude of the balancing mass, if the radius of rotation is 60 cm. (10 Marks) *

10 points

Mark only one oval.

- 29 kg
- 20 kg
- 39 kg
- 18 kg

4. If governor balls have one particular fixed radius for each given speed in the equilibrium position, such a governor is said to be..... *

1 point

Mark only one oval.

- sensitive
- insensitive
- stable
- unstable
- isochronous

5. If the controlling force of a spring controlled governor decreases with increase in radius of rotation then governor is said to be..... *

Mark only one oval.

- sensitive
- insensitive
- isochronous
- powerful
- unstable

6. For two governors A and B, the lift of sleeve of governor A is more than that of governor B, for a given fractional change in speed. It indicates that *

Mark only one oval.

- Governor A is more sensitive than governor B
- Governor B is more sensitive than governor A
- Both governors A and B are equally sensitive
- None of the above

7. Which of the following is true for centrifugal force causing unbalance? *

Mark only one oval.

- Direction changes with rotation
- Magnitude changes with rotation
- Direction and magnitude both change with rotation
- Direction and magnitude both remain unchanged with rotation

8. For isochronous, spring controlled governor, the controlling force with increase in radius of rotation *

1 point

Mark only one oval.

- Increase
- Decreases
- Remains constant
- Behaves M unpredictable way

9. Height of a Governor is distance measured from *

1 point

Mark only one oval.

- the centre of two balls mass
- the centre of balls mass to the point of intersection of upper arms
- the centre of balls mass to the point of intersection of lower links
- the point of intersection of upper arms to the point of intersection of lower links

10. The sensitiveness of a Governor is..... Where N_1 =Minimum equilibrium speed, N_2 =Maximum equilibrium speed, N =Mean speed *

1 point

Mark only one oval.

- $(N_2+N_1)/N$
- $(N_2-N_1)/N$
- $(N_2+N_1) \times N$
- $(N_2-N_1) \times N$

11. What is the effect of a rotating mass of a shaft on a system? *

1 point

Mark only one oval.

- Bend the shaft
- Twist the shaft
- Extend the shaft
- Compress the shaft

12. In a spring controlled governor, when the controlling force _____ as the radius of rotation increases, it is said to be a stable governor. * 1 point

Mark only one oval.

- remains constant
- decreases
- increases

13. A spring controlled governor is found unstable. It can be made stable by * 1 point

Mark only one oval.

- increasing the spring stiffness
- decreasing the spring stiffness
- increasing the ball mass
- decreasing the ball mass

14. Which of the following factors are not responsible for unbalancing in rotating systems? * 1 point

Mark only one oval.

- Errors
- Tolerances
- Shape of the rotor
- None of the above

15. Effort of a governor is the * 1 point

Mark only one oval.

- mean force exerted at the sleeve for a given percentage change of speed
- work done at the sleeve for maximum equilibrium speed
- mean force exerted at the sleeve for maximum equilibrium speed
- none of the above

16. In a Hartnell governor, if the spring of greater stiffness is used, then the governor will be * 1 point

Mark only one oval.

- Less Sensitive
- More Sensitive
- Unaffected of Sensitivity
- Isochronous

17. A governor is said to be hunting, if the speed of the engine * 1 point

Mark only one oval.

- remains constant at the mean speed
- is above the mean speed
- is below the mean speed
- fluctuates continuously above and below the mean speed

18. For static balancing of a shaft * 1 point

Mark only one oval.

- the net dynamic force acting on the shaft is equal to zero
- the net couple due to the dynamic forces acting on the shaft is equal to zero
- both A. and B
- none of the above

19. Isochronism in a governor is desirable when * 1 point

Mark only one oval.

- the engine operates at low speeds
- the engine operates at high speeds
- the engine operates at variable speeds
- one speed is desired under one load

20. The power of a governor is equal to *

1 point

Mark only one oval.

- $(c^2/1 + 2c)(m + M) h$
- $(2c^2/1 + 2c)(m + M) h$
- $(3c^2/1 + 2c)(m + M) h$
- $(4c^2/1 + 2c)(m + M) h$

21. When the relation between the controlling force (F_c) and radius of rotation (r) for a spring controlled governor is $F_c = a.r + b$, then the governor will be *

1 point

Mark only one oval.

- stable
- unstable
- isochronous
- none of the mentioned

22. The ratio of height of porter governor (when length of arms and links are equal) to the height of watt governor is (Where m is the mass of the ball and M is the mass of sleeve) *

1 point

Mark only one oval.

- $(m+M)/m$
- $M/(m+M)$
- $m/(m+M)$
- None of the above

23. For the static balancing of the engine, which of the condition is necessary? *

1 point

Mark only one oval.

- Force polygon must be close
- Couple polygon must be close
- Both (A) and (B)
- None of these

24. In a spring loaded Hartnell type governor, the extreme radii of rotation of the balls are 80mm and 120mm. The ball and sleeve arms of the bell crank lever are equal in length. The mass of each ball is 2kg. If the speeds at the two extreme positions are 400 rpm and 420 rpm. Find: Stiffness of the spring (10 Marks) *
- 10 points

Mark only one oval.

- 9200 N/m
- 9350 N/m
- 9050 N/m
- 9400 N/m

25. Each arm of a porter governor is 200 mm long and is pivoted on the axis of the governor. The radii of rotation of the balls at the minimum and the maximum speeds are 120 mm and 160 mm respectively. The mass of the sleeve is 24 Kg and each ball is 4 kg. Find the range of speed of the governor. (10 Marks) *
- 10 points

Mark only one oval.

- 31 rpm
- 38 rpm
- 25 rpm
- 42 rpm
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