

Roll No

ME-503 (B) (CBGS)

B.Tech. V Semester

Examination, November 2019

Choice Based Grading System (CBGS)

Dynamics of Machine

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

किन्हीं पाँच प्रश्नों को हल कीजिए।

ii) All questions carry equal marks.

सभी प्रश्नों के समान अंक हैं।

iii) In case of any doubt or dispute the English version question should be treated as final.

किसी भी प्रकार के संदेह अथवा विवाद की स्थिति में अंग्रेजी भाषा के प्रश्न को अंतिम माना जायेगा।

1. A crank of a slider crank mechanism is 15cm and the connecting rod is 60 cm long. The crank makes 300 rpm in the clockwise direction. When it has turned 50° from the inner dead centre position, determine the (i) Velocity of slider (ii) Angular velocity of connecting rod and (iii) Linear Velocity of the mid point of the connecting rod

एक slider crank mechanism की crank व connecting rod की लम्बाई क्रमशः 15cm और 60 cm है। Crank 300 rpm की गति से clockwise direction में घूम रहा है। Crank जब inner dead centre से 50° घूम चुका है उस समय (i) Velocity of slider (ii) Angular velocity of connecting rod व (iii) Linear velocity of the mid point of the connecting rod की गणना कीजिए।

2. a) Differentiate between the function of a flywheel and governor in a steam engine.

वाष्प इंजन में Flywheel व Governor के कार्यों का अंतर स्पष्ट कीजिए।

- b) Derive the equation $\Delta E = m \times v^2 \times k_s$ where $E = KE$ of flywheel, $k_s =$ coefficient of fluctuation of speed, $m =$ mass of flywheel and $v =$ linear velocity of the rim of flywheel at the mean radius.

निम्नलिखित equation को prove करें।

$\Delta E = m \times v^2 \times k_s$ जहाँ $E = KE$ of flywheel, $k_s =$ coefficient of fluctuation of speed, $m =$ mass of flywheel and $v =$ linear velocity of the rim of flywheel at mean radius.

3. a) Derive an expression for the height of watt governor and prove that it is inversely proportional to the square of the speed of governor.

एक watt governor की height का formula derive करें और बताइए की यह square of speed of governor में समतुल्य है।

- b) What is hunting of governor?

Hunting of governor से आप क्या समझते हैं?

4. The length of the upper arm and lower arms of a porter governor are 200 mm and 250 mm respectively. Both the arms are pivoted on the axis of rotation. The weight of each ball is 30 N and the central load on the sleeve is 225 N and the friction of the sleeve together with the resistance of the operating gear is equivalent to a force of 45N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40° , determine the range of speed of governor.

एक porter governor में upper and lower arms की लंबाई क्रमशः 200 mm और 250 mm है। दोनों भुजाएँ axis of rotation से जुड़ी हैं। हर एक बाल का वजन 30 N है तथा sleeve पर central load 225 N है। Sleeve का friction, sleeve में 45N के बल के साथ मिलकर यदि upper arm की limiting inclination vertical से 30° and 40° हो तो governor के range of speed की गणना करें।

5. a) What is meant by static and dynamic unbalance in machinery?

आप किसी मशीन के static और dynamic unbalance से क्या समझते हैं?

b) Determine the unbalanced forces and couples in a two cylinder engine.

एक two cylinder engine में unbalanced forces and couples के बारे में बताइए।

6. a) Do you recommend uniform pressure theory or uniform wear theory for friction torque of a bearing. Explain.

एक bearing के friction torque की uniform pressure theory or uniform wear theory द्वारा गणना की जाती है? समझाइये।

b) Explain the working of a multiplate clutch with a neat diagram. <http://www.rgpvonline.com>

एक multiplate clutch का diagram बनाकर, उसकी कार्यप्रणाली बताइए।

7. a) What is a Dynamometer? Explain any one Dynamometer. Dynamometer क्या है एक Dynamometer का पूर्ण विवरण दें।

b) Explain the working of band brake.

एक Band brake की कार्यप्रणाली बताइए।

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8. Write short notes on any three :

निम्नलिखित में से किन्हीं तीन पर संक्षिप्त नोट लिखें।

a) Characteristics of centrifugal governor

b) Balancing of three rotating mass on different planes.

c) Friction torque in pivot by uniform pressure

d) Friction circle and its uses

e) Response of undamped cam mechanism

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