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ET-505

B.Tech. Civil (Construction Management)/ B.Tech. Civil (Water Resources Engineering)

Term-End Examination

June, 2014

ET-505 : TRANSPORTATION AND TRAFFIC ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **all** questions. All questions carry equal marks. Use of calculator is permitted.*

1. Answer any ***two*** of the following : *2×5=10*

(a) Write briefly on principal modes of transport in India.

(b) Following data are available for two road projects :

Name	Initial cost of construction	Annual maintenance cost
Project A	₹ 20 crores	₹ 20 lakhs
Project B	₹ 30 crores	₹ 3 lakhs

What is more attractive from the economic point of view ? Assume providing interest rate as 10 per cent per annum.

(c) What is IRC ? Give a short note on this.

2. Answer any ***two*** of the following : *2×5=10*

(a) Calculate the ruling radius for National Highways in plain terrain. State the assumptions made.

(b) Sketch a typical road section and mark and explain Carriageway, Shoulder, Median and Camber.

(c) Determine the value of cohesion and internal friction of the said sample from the following data of Direct shear test :

Compressive force	Maximum shear force
5 kg	7·00 kg
10 kg	10·00 kg
15 kg	12·60 kg
20 kg	14·40 kg

The loaded area of the sample is 36 cm^2.

3. Answer any ***two*** of the following : *2×5=10*

(a) What are various factors attributable to road users that cause road accidents ?

(b) Explain basic difference between Rigid and Flexible pavements.

(c) Find out the radius of contact area of the tyre subjected to an axle load of 160 kN with tyre pressure as 0·8 MN/m^2.

4. Answer any ***two*** of the following : *2×5=10*

(a) Derive formula for determining the stopping sight distance and overtaking sight distance.

(b) Determine the length of summit curve at the junction of two gradients of +2% and –1% for (i) stopping sight distance of 160 m and (ii) overtaking sight distance of 450 m.

(c) Name the various tests that are performed on segregates to be used for road work. Describe any one of these tests in detail.

5. Answer any ***two*** of the following : *2×5=10*

(a) Describe the requirements of good sleepers. Also explain the functions of ballast in a railway track.

(b) A 13 m rail is laid at 35°C and expected maximum rise of temperature is 75°C. Find out the expansion gap to be provided, while laying the track.

(Coefficient of expansion of rail steel = 0·00001152 per °C)

(c) Name the ancillary facilities provided in a railway station for its efficient functions. Describe any two of these facilities.

6. Answer any ***two*** of the following : *2×5=10*

(a) Discuss the merits and demerits of Air Transport System.

(b) Calculate the thickness of an Airport flexible pavement for an equivalent single wheel load of 50 kN. The subgrade has a CBR value of 5 and the tyre pressure is 1·5 MN/m^2.

(c) How is the runway orientation decided ? What are the factors that influence runway length ?

7. Answer any ***two*** of the following : *2×5=10*

(a) What are different inland waterways ? State their advantages and disadvantages.

(b) What are belt conveyors ? Explain in brief their various configurations.

(c) Discuss about Ropeway Transport system.
