Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2013

Subject code: 1721903 **Date: 03-06-2013**

Subject Name: Highway Construction and Management

Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** State and explain the surveys to be carried out in preparation of detailed project report for new highway construction. **07**

(b) Differentiate between the following: **07**

i. Water Bound Macadam (WBM) and Wet Mix Macadam(WMM)

ii. Bitumen Penetration Macadam and Inverted Penetration Macadam.

Q.2 **(a)** Enlist various designs to be carried out prior to construction of new highways. Explain how tendering process is carried out in highway construction? **07**

(b) Write specifications and construction procedures for Prime Coat and Tack coat. **07**

OR

(b) Explain stages in engineering project construction from conception to realization. **07**

Q.3 **(a)** Explain construction procedure for Gravel Road Construction. **07**

(b) Write necessity and objectives of highway construction management. **07**

OR

Q.3 **(a)** Explain with sketches the various methods for cement concrete pavement construction. **07**

(b) Explain properties and functions of joint fillers and joint sealers in cement concrete pavements. **07**

Q.4 **(a)** Enlist and explain tools and plants required for Cement Concrete Pavement construction. **07**

(b) Write note: Hot Mixed Hot Laid Plant Mixes **07**

OR

Q.4 **(a)** Explain giving proper tabular formats construction, materials, labour and equipments schedules. **07**

(b) Prepare construction schedule with bar chart for the new highway construction project with following details: **07**

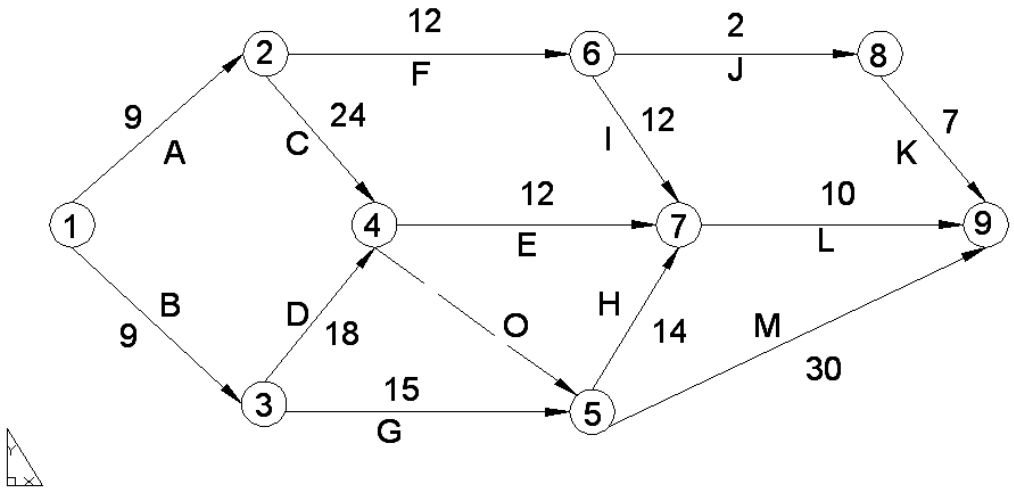
Length of highway =20 km, Width of ROW=35 m, Clearing and Grubbing=70 Hectare, Cross-drainage structures(CDS) = 12 multi-box RCC culverts, Earth fill in excess of cut from borrow area with average haul distance of 1.2 km =150000m3 (Bank measure volume), Concrete pavement of 22.5 cm thickness with carriage width of 7.0 m.

- Buldozers for clearing and grubbing has output =0.40hectare per day
- 3 week time is required for each CDS and 3 CDS are constructed at a time,
- Power shovel, with capacity of 1.17 m3 and output of 117m3/ hr for earth fill
- 6 trucks with 4.5 m3 capacity each is available
- Motor grader, sheep foot roller and truck mounted water tank available,
- For pavement concrete work 1 m3 capacity concrete mixer and 1 paver is at site ,
- Moving in period for equipments and plants is 1 week.

Q.5 (a) Define the following terms(Any seven): **07**

Activity, Dummy activity, Total float, Free float, Critical path, Optimistic time estimate, Pessimistic time estimate, Most likely time estimate, direct cost , indirect cost.

(b) Find critical path for the activity network shown below and draw bar chart. **07**



OR

Q.5 (a) Enlist various management techniques used to complete project in time. Write note on CPM. **07**

(b) Write note on: **07**

i. MS Project Software

ii. Primawera Software

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