

**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**  
**SECOND SEMESTER 2017 – 2018**

**CONSTRUCTION MANAGEMENT - Mid Semester Exam**

**Course No: CE G527**

**Date: 08-03-2017 [2:00 PM start]**

**Duration: 90 Mins (Closed book)**

**Max. Marks: 70**

**I: Choose the best answers:**

**[10 x 1=10]**

1. Mediator has the right to make opinions and judgments in case of disputes (True/False)
2. Break-even point marks the highest level at which the production cost and the actual cost are equal (True/False)
3. Cost apportionment refers to the process of allocating project direct cost among various responsibility centers (True/False)
4. The under-estimation of the contract and subsequent winning of the contract is often called as \_\_\_\_\_
5. The forecasting accuracy is very high in case “Class C” materials (True/False)
6. “Fire protection and fighting systems” is listed under the building works category \_\_\_\_\_ (Structural works, civil works, engineering services)
7. CPI value less than “one” indicates that typically the cost-under run (True/False)
8. Exploit is the term associated with the negative risks (True/False)
9. The most common risk associated with the road project is \_\_\_\_\_
10. The most suitable contract dealing with the repair and maintenance of the existing facility is \_\_\_\_\_

**II: Short answers**

**[10 x 2 = 20]**

- 1) What is the basic philosophy behind the lean construction management?
- 2) Define indirect cost and give an example of indirect cost.
- 3) Explain the term “unfavorable material usage variance” and “favorable price variance”.
- 4) What is the difference between direct cost control and direct cost reduction?
- 5) What is the primary reason behind imbalance between the contractor’s cash inflows and outflows?
- 6) What is the advantage of arbitration clause in the contract document?
- 7) Explain collusive bidding schemes.
- 8) 150 sq. m. of fixing wood work for roof slab is to be completed in 3 days. The team comprising 2 skilled and 1 unskilled persons is capable of achieving the rate of 1.25 sq. m/hour. The work duration is assumed to be 8 hours/day.
- 9) What is the difference between permanent materials and supplies?
- 10) What is the biggest advantage of going for renting the equipment for the construction project execution?

**III: Long answers:****[40 marks]**

- 1) Estimate labour hourly standard cost for a typical skilled mason considering the standard practice.
- 2) Determine the EOQ, minimum stock level, maximum stock level, ROL for the following inventory data.  
 Site requirement: 500 tons/month for 12 months  
 Ordering cost = Rs. 10000/order  
 Inventory carrying cost = 20% of unit rate; Unit rate: Rs. 5000/ton; Transport capacity: 30 tons  
 Lead time: 7 days; Safety stock: 100 tons; Materials life: 3 months

Note:  $EOQ = (1/P) * \sqrt{2 * \text{ordering cost} * \text{Total consumption cost/inventory cost}}$

- 3) Consider the data reported below at the end of the 10<sup>th</sup> week of the one-storey office building, which is scheduled for completion at the end of 30<sup>th</sup> week;

Activity	Planned Progress (in %)	Actual progress (in %)	BAC (Rs.)
Earthquake Excavation & Foundation	100	100	1,00,000
Plinth level concrete	100	85	30,000
Raising of the column	100	50	50,000
First floor roof slab	50	40	25,000
Flooring & Finishing	---	----	80,000
Engineering services and Architectural works	-----	----	90,000
Administrative expenses			50,000

Determine the cost forecast at completion for (a) remaining work shall progress at planned rates, (b) remaining work shall progress at prevailing trend.

- 4) Calculate the ownership cost per hour for a crawler-type excavator powered by a 250 hp. Diesel engine based on the following data.  
 Engine: 250 hp. diesel  
 Operating factor: 50%  
 Purchase price: Rs. 4,20,000  
 Freight charges: Rs. 20,000  
 Estimated salvage value: Rs. 2,00,000  
 Useful life: 5 years  
 Hours used per year: 1000  
 Maintenance & Repairs: 110% annual depreciation  
 Equipment overhead rate: 10%  
 Fuel consumption per hour: 1 litre per hour; Cost of fuel: Rs. 70 per litre.