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CRH 401

First Semester M.Com. (HRD) Degree Examination, December 2018
(Choice Based Credit System)
COMMERCE
Business Statistics

Time : 3 Hours

Max. Marks : 70

SECTION – A

Note : a) Answer **any four** questions. **(4×10=40)**

b) **Each** question carries **10** marks.

c) Answer to **each** theory question should **not** exceed **four** pages.

1. Simplify :

a)
$$\frac{3^{3^2} - (3^3)^2}{(3^0)^2 + 4(3)^{2^0}} \times \frac{3^2}{(3^4)^2}$$

b) Solve : $2\sqrt{x} + 5\sqrt{y} - 8\sqrt{z} - \sqrt{x} + 7\sqrt{y} + 12\sqrt{z} - 5\sqrt{x} + 18\sqrt{x} - 14\sqrt{y}$.

2. In how many ways a cricket team consisting of 11 players is chosen out of a batch of 18 players ? How many of them will

a) Include a particular player,

b) Exclude a particular player ?

3. a) Rationalize :
$$\frac{8}{\sqrt{7} + \sqrt{3}} + \frac{17}{3\sqrt{5} + 2\sqrt{7}} + \frac{33}{3\sqrt{5} + 2\sqrt{3}}$$

b) The sum of an arithmetic progression is 80 and the common difference is 2 and the last term is 17. Find the first term and the number of terms.

4. Describe the utility of Time Series Analysis.

P.T.O.



5. Five men in a group of 20 are graduates. If 3 men are picked out of 20 at random
- What is the probability that all are graduates, and
 - What is the probability of at least one being graduate ?
6. Show that the middle term in the expansion of $(1 + x)^{2n}$ is $\frac{1, 3, 5 (2n - 1)}{n!} \cdot 2^n x^n$.
7. Explain the properties of normal distribution.

SECTION – B

- Note :** a) Answer **any two** questions. **(2×15=30)**
 b) **Each** question carries **15** marks.
 c) Answer to **each** theory question should **not** exceed **seven** pages.

8. Fit a straight line trend by the method of least squares to the following data. Assuming the same rate of change continues what would be the predicted sales for the year 2018.

Year	2006	2007	2008	2009	2010	2011	2012	2013
Sales (in lakhs)	76	80	130	144	138	120	174	190

- Calculate the trend values from 2006 to 2013.
 - Plot these figures on graph and show the trend line.
 - What is the annual increase or decrease in the expected sales of the firm ?
9. Bad gums may mean a bad heart. Researchers at a medical college discovered that 85% of people who have suffered a heart attack had periodontal disease, and inflammation of the gums. Only 29% of healthy people (who have not suffered a heart attack) have this disease. Suppose that in a certain community, heart attacks are occurring with 40% probability,
- If someone has periodontal disease, what is the probability that he or she will have a heart attack ?
 - What is the probability of having a periodontal disease ?
10. An inspection of 10 samples of size 400 each from 10 lots revealed the following number of defective units.
 17, 15, 14, 26, 9, 4, 19, 12, 9, 15
 Calculate control limits for the number of defective units. Plot the control limits and the observations and state whether the process is under control or not.