Questions from Time Series (2016,2018,2019)

1.(a) Seasonal variations of a time series occur　　　　　　　　　　1

i. within a month

ii. within a week

iii. within a year

iv. within a day

(Choose the correct answer)

(b) What is time series?　　　　　　　　　　　　　　　　　　1

(c) What will be the form of trend equation when trend is linear?　　1

2. (a) The trend line equation of a time series with middle year 2007 is given by $Y = 95 + 3 . 9t$. Estimate a trend value for the year 2015. Also eliminate the trend assuming the actual value to be 125.　　　　　　　　　　2

(b) Mention the components of a time series.　　　　　　　　2

(c) What is meant by deseasonalization of data of a time series　　2

(d) What are the four important methods of measuring trend　　2

3.(a) Calculate trend values by the principle of least square for the following time series. Also eliminate the trend using multiplicative model:　　3+2=5

Year　　　　　　　: 2001　2002　2003　2004　2005　2006　2007

Sales (Rs in lakh)　: 76　80　130　144　138　120　172

(b) Explain how exponential trend curves are fitted using the principle of least squares.　　　　　　　　　　　　　　　　　　5

(c) Calculate trend values using 4 yearly-moving average for the time series given below :   5

Year   : 2008 2009 2010 2011 2012 2013 2014 2015 2016

Production (kg) : 506 620 1036 673 588 696 1116 738 663

(d) Discuss the various components of time series.   5

4.(a) Define time series with example. Mention the uses of time series. Calculate trend values using 4 yearly-moving average for the time series below

2+3+5=10

Year   : 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

Demand for x

(In '000 tons) : 80 84 80 88 98 92 84 88 80 100

(b) (i) Fit a trend line to the following data by the method of least squares   6

Year   : 1970 1971 1972 1973 1974

Production

(In '000 tons) : 18 21 23 27 26

(ii) Calculate the trend values.   2

(iii) Estimate the production in 1975.   2

(c) Discuss the moving average method. Calculate 5 yearly-moving average from the data given below   4+6=10

Year   : 2010 2011 2012 2013 2014 2015 2016 2017 2018

Sales (Rs in '000) : 6.4 4.3 4.3 3.4 4.4 5.4 3.4 2.4 1.4

(d) Fit a trend line to the following data by the method of least square.

6+2+2=10

Year : 2000 2001 2002 2003 2004 2005 2006

Profit (Rs in lakh) : 60 72 75 65 80 95

(i)Calculate the estimated trend values.

(ii)Also estimate the likely profit for 2008.