FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI
SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY
DEPARTMENT OF POLYMER AND TEXTILE ENGINEERING
2014/2015 HARMATTAN SEMESTER EXAMINATION
PTE 307: YARN MANUFACTURE
TIME: 2 ½ HRS DATE: MAY 06, 2015. INSTRUCTIONS: ANSWER FIVE QUESTIONS

1(a) Using a well labeled diagram, describe the operation of a rectilinear cotton machine
(b) 6kg of fibres rotate in a hopper opener of radius 5mm at uniform speed 18m/s. Calculate
i. The angular velocity
ii. Centripetal acceleration
iii. The centripetal force

2(a). Give five objectives of blending. List four examples of blended fabrics and their properties.
(b) Fibres revolved 6 times in 8 seconds in a bale opener of radius 20cm. Find:
i. Angular velocity in radian per second
ii. Linear speed
iii. The distance covered in 4seconds

3(a) Explain the processes involved in the woolen system.
(b) An ultra cleaner carrying 100kg of fibres covered a distance of 12m in 3second. Calculate the kinetic energy.

4(a) Discuss how silk yarn can be obtained
(b) Bottom calendar roller of diameter 8mm moved with a speed of 22m/s. Calculate the lap length (take $\pi = 3.142$).

5(a) Using a well labeled diagram, describe the working principle of a ring frame machine
(b) A carding machine release 37.2kg of trash and the amount of trash on the lap is 43.3kg. calculate the cleaning efficiency of the machine.

6(a) Briefly discuss the classes of yarn
(b) State four objectives of combing
(c) With the aid of a diagram, explain the mechanism of hopper bale breaker.

7(a) Write a short note on mixing and blending of textile fibres and state difference between them.
(b) Calculate the work done in lifting a bale of cotton fibres of mass 100kg from the ground to a delivery bay 5m above the ground level. If the bale accidentally slips from the bay, what power is expended in its fall?