



In this test, there are 20 multiple choice questions with 5 points for each question. Please select the correct answer for each question.

1. An U.S. southern state has night state universities in its system. The numbers of volumes (in thousands) held in their libraries are 83, 510, 33, 256, 856, 1085, 401, 47, and 23. The standard deviation of the numbers of volumes of the seven state universities is:
(A) 133502.54 (B) 365.38 (C) 387.54 (D) 150187.25 (E) 1201498.00
2. A fair coin is tossed three times and the events X and Y are defined as follows:
X: {At least one head is observed}
Y: {The number of heads observed is odd}
What is the probability of $P(X \cap Y)$?
(A) 7/8 (B) 6/8 (C) 5/8 (D) 4/8 (E) 3/8
3. The New York Yankees baseball team plays 80 percent of their games at night and 20 percent during the day. The team wins 60 percent of their night games and 70 percent of their day games. According to today's newspaper, they won yesterday. What is the probability the game was played at night?
(A) 60% (B) 70% (C) 77% (D) 87% (E) 92%
4. Ten percent of new automobiles will require warranty service within the first year. Jones Honda sells 12 automobiles in April. What is the probability that less than two automobiles require warranty service?
(A) 0.23013 (B) 0.28243 (C) 0.37657 (D) 0.65900 (E) 0.88913
5. A recent study by the Taiwan Highway Patrolman's Association revealed that 60 percent of Taiwanese back-seat passengers use their seat belts. A sample of 10 back-seat passengers in Taipei is selected. What is the probability that 8 or fewer of the back-seat passengers are wearing seat belts?
(A) 0.99395 (B) 0.95969 (C) 0.95364 (D) 0.87907 (E) 0.83271
6. A study of the lines at the checkout registers of Safeway Supermarket revealed that, during a certain period at the rush hour, the number of customers waiting averaged four. What is the probability that during the period four customers were waiting?
(A) 0.165 (B) 0.175 (C) 0.185 (D) 0.195 (E) 0.205



7. A manufacturer of automobile batteries claims that the distribution of the lengths of life of its best battery has a mean of 55 months and a standard deviation of 6 months. Suppose a consumer group decides to check the claim by purchasing a sample of 50 of these batteries and subjecting them to tests that determine battery life. Assuming that the manufacturer's claim is true, what is the probability the consumer group's sample has a mean life of 53 or fewer months?
(A) 0.0091 (B) 0.1291 (C) 0.3709 (D) 0.4909 (E) 0.5091
8. A cola-dispensing machine is set to dispense on average 7.00 ounces of cola per cup. The standard deviation is 0.10 ounces. What is the probability that a machine will dispense between 6.85 and 7.25 ounces of cola?
(A) 0.4332 (B) 0.4938 (C) 0.8664 (D) 0.9270 (E) 0.9876
9. A study conducted by the Taurus Health Club revealed that 40 percent of its new members are significantly overweight. A membership drive in a metropolitan area resulted in 500 new members. What is the probability that 220 or more of the new members are overweight?
(A) 0.0375 (B) 0.1760 (C) 0.4400 (D) 0.4625 (E) 0.0336
10. Suppose the President wants an estimate of the proportion of the population who support his current policy toward China. The President wants the estimate to be within 0.03 of the true proportion. Assume a 95 percent level of confidence. The Secretary of State estimated the proportion supporting current policy to be 0.40. How large a sample is required?
(A) 722 (B) 1025 (C) 1068 (D) 1667 (E) 2400

Use the following problem to answer questions 11-14.

How well do airline companies serve their customers? A study showed the following customer ratings: 3% excellent, 28% good, 45% fair, and 24% poor. In a similar study of service by telephone companies, assume that a sample of 400 adults found the following customer ratings: 24 excellent, 124 good, 172 fair, and 80 poor. Is the distribution of the customer ratings for telephone companies different from the distribution of customer ratings for airline companies? Test at $\alpha = .05$.

11. Which of the following methods will you properly suggest?
(A) t-test (B) z-test (C) Regression analysis (D) ANOVA (E) Chi-square test



12. Which null hypothesis is being tested?
- (A) $H_0: \mu_d = 0$.
- (B) $H_0: \mu_1 - \mu_2 = 0$.
- (C) $H_0: P_1 - P_2 = 0$.
- (D) $H_0: P_1 = 0.03, P_2 = 0.28, P_3 = 0.45, P_4 = 0.24$
- (E) Customer ratings for airline companies and telephone companies are independent.
13. The critical value of the test is
- (A) 7.815 (B) 2.3534 (C) 1.96 (D) 2.7764 (E) 1.645
14. The calculated value for the test statistic equals
- (A) 16.84 (B) 11.34 (C) 11.07 (D) 5.99 (E) 4.37

Use the following problem to answer questions 15-17.

A firm would like to develop a regression model to forecast its yearly sales in each of its sales regions. The firm has decided to base its forecast on regional population size (x_1) and its yearly regional advertising expenditures (x_2). Two models are fit to data collected from $n=24$ and which are

Full model: $E(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 x_2 + \beta_4 x_1^2 + \beta_5 x_2^2$ (SSE=159.94)

Reduced Model: $E(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_2$ (SSE=309.44)

15. What hypothesis would you test to determine which model is better?
- (A) $H_0: \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$.
- (B) $H_0: \beta_0 = \beta_1 = \beta_2 = 0$.
- (C) $H_0: \beta_3 = \beta_4 = \beta_5 = 0$.
- (D) $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$.
- (E) $H_0: \beta_1 = \beta_2 = 0$.
16. What is the value of the test statistic for concluding that the full model contributes more information for the prediction of y than does the reduced model?
- (A) 1.88 (B) 5.61 (C) 8.89 (D) 16.68 (E) 14.95
17. The critical value of the test is
- (A) 28.869 (B) 2.3534 (C) 1.96 (D) 3.16 (E) 1.645


Use the following problem to answer questions 18-19

Researchers studied the attitudes of three groups of professionals that influence U.S. policy governing new technologies: Scientists, Journalists, and Federal government policymakers. Random samples of 21 scientists, 21 journalists, and 21 government officials were asked about the safety of nuclear power plants. Response were make on a seven-point scale, where 1=very unsafe and 7=very safe. The mean safety scores for the groups are scientists, 4.1; journalists, 3.7; government officials, 4

18. How many treatments are included in this study?
 (A) 7 (B) 21 (C) 3 (D) 4 (E) 2
19. The MSE for the sample data is 2.355 and the SST (treatment) for the sample is 22.56. What is the test statistic if we want to test whether there are differences in the attitudes of scientists, journalists, and government officials regarding the safety of nuclear power plants?
 (A) 3.15 (B) 2.355 (C) 8.89 (D) 11.28 (E) 4.79
20. A researcher was interested in comparing the salaries of female and male employees of a particular company. Independent random samples of 8 female and 15 males yielded the following weekly salaries (in dollars).

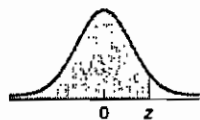
| Female | Male | |
|--------|------|------|
| 495 | 722 | 518 |
| 760 | 562 | 904 |
| 556 | 880 | 1150 |
| 904 | 520 | 805 |
| 520 | 500 | 480 |
| 1005 | 1250 | 970 |
| 743 | 750 | 605 |
| 660 | 1640 | |

Determine a 98% confidence interval for the difference between the mean weekly salary of all females and males.

- (A) -\$385 to \$164 (B) -\$382 to \$158
 (C) -\$431 to \$208 (D) -\$383 to \$159
 (E) None of the above is true.



TABLE II (cont.)
Areas under the
standard normal curve



| z | Second decimal place in z | | | | | | | | | |
|-----|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 0.00 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
| 0.0 | 0.5000 | 0.5040 | 0.5080 | 0.5120 | 0.5160 | 0.5199 | 0.5239 | 0.5279 | 0.5319 | 0.5359 |
| 0.1 | 0.5398 | 0.5438 | 0.5478 | 0.5517 | 0.5557 | 0.5596 | 0.5636 | 0.5675 | 0.5714 | 0.5753 |
| 0.2 | 0.5793 | 0.5832 | 0.5871 | 0.5910 | 0.5948 | 0.5987 | 0.6026 | 0.6064 | 0.6103 | 0.6141 |
| 0.3 | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 | 0.6368 | 0.6406 | 0.6443 | 0.6480 | 0.6517 |
| 0.4 | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.6700 | 0.6736 | 0.6772 | 0.6808 | 0.6844 | 0.6879 |
| 0.5 | 0.6915 | 0.6950 | 0.6985 | 0.7019 | 0.7054 | 0.7088 | 0.7123 | 0.7157 | 0.7190 | 0.7224 |
| 0.6 | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 | 0.7422 | 0.7454 | 0.7486 | 0.7517 | 0.7549 |
| 0.7 | 0.7580 | 0.7611 | 0.7642 | 0.7673 | 0.7704 | 0.7734 | 0.7764 | 0.7794 | 0.7823 | 0.7852 |
| 0.8 | 0.7881 | 0.7910 | 0.7939 | 0.7967 | 0.7995 | 0.8023 | 0.8051 | 0.8078 | 0.8106 | 0.8133 |
| 0.9 | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 | 0.8289 | 0.8315 | 0.8340 | 0.8365 | 0.8389 |
| 1.0 | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 | 0.8531 | 0.8554 | 0.8577 | 0.8599 | 0.8621 |
| 1.1 | 0.8643 | 0.8665 | 0.8686 | 0.8708 | 0.8729 | 0.8749 | 0.8770 | 0.8790 | 0.8810 | 0.8830 |
| 1.2 | 0.8849 | 0.8869 | 0.8888 | 0.8907 | 0.8925 | 0.8944 | 0.8962 | 0.8980 | 0.8997 | 0.9015 |
| 1.3 | 0.9032 | 0.9049 | 0.9066 | 0.9082 | 0.9099 | 0.9115 | 0.9131 | 0.9147 | 0.9162 | 0.9177 |
| 1.4 | 0.9192 | 0.9207 | 0.9222 | 0.9236 | 0.9251 | 0.9265 | 0.9279 | 0.9292 | 0.9306 | 0.9319 |
| 1.5 | 0.9332 | 0.9345 | 0.9357 | 0.9370 | 0.9382 | 0.9394 | 0.9406 | 0.9418 | 0.9429 | 0.9441 |
| 1.6 | 0.9452 | 0.9463 | 0.9474 | 0.9484 | 0.9495 | 0.9505 | 0.9515 | 0.9525 | 0.9535 | 0.9545 |
| 1.7 | 0.9554 | 0.9564 | 0.9573 | 0.9582 | 0.9591 | 0.9599 | 0.9608 | 0.9616 | 0.9625 | 0.9633 |
| 1.8 | 0.9641 | 0.9649 | 0.9656 | 0.9664 | 0.9671 | 0.9678 | 0.9686 | 0.9693 | 0.9699 | 0.9706 |
| 1.9 | 0.9713 | 0.9719 | 0.9726 | 0.9732 | 0.9738 | 0.9744 | 0.9750 | 0.9756 | 0.9761 | 0.9767 |
| 2.0 | 0.9772 | 0.9778 | 0.9783 | 0.9788 | 0.9793 | 0.9798 | 0.9803 | 0.9808 | 0.9812 | 0.9817 |
| 2.1 | 0.9821 | 0.9826 | 0.9830 | 0.9834 | 0.9838 | 0.9842 | 0.9846 | 0.9850 | 0.9854 | 0.9857 |
| 2.2 | 0.9861 | 0.9864 | 0.9868 | 0.9871 | 0.9875 | 0.9878 | 0.9881 | 0.9884 | 0.9887 | 0.9890 |
| 2.3 | 0.9893 | 0.9896 | 0.9898 | 0.9901 | 0.9904 | 0.9906 | 0.9909 | 0.9911 | 0.9913 | 0.9916 |
| 2.4 | 0.9918 | 0.9920 | 0.9922 | 0.9925 | 0.9927 | 0.9929 | 0.9931 | 0.9932 | 0.9934 | 0.9936 |
| 2.5 | 0.9938 | 0.9940 | 0.9941 | 0.9943 | 0.9945 | 0.9946 | 0.9948 | 0.9949 | 0.9951 | 0.9952 |
| 2.6 | 0.9953 | 0.9955 | 0.9956 | 0.9957 | 0.9959 | 0.9960 | 0.9961 | 0.9962 | 0.9963 | 0.9964 |
| 2.7 | 0.9965 | 0.9966 | 0.9967 | 0.9968 | 0.9969 | 0.9970 | 0.9971 | 0.9972 | 0.9973 | 0.9974 |
| 2.8 | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 |
| 2.9 | 0.9981 | 0.9982 | 0.9982 | 0.9983 | 0.9984 | 0.9984 | 0.9985 | 0.9985 | 0.9986 | 0.9986 |
| 3.0 | 0.9987 | 0.9987 | 0.9987 | 0.9988 | 0.9988 | 0.9989 | 0.9989 | 0.9989 | 0.9990 | 0.9990 |
| 3.1 | 0.9990 | 0.9991 | 0.9991 | 0.9991 | 0.9992 | 0.9992 | 0.9992 | 0.9992 | 0.9993 | 0.9993 |
| 3.2 | 0.9993 | 0.9993 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9995 | 0.9995 | 0.9995 |
| 3.3 | 0.9995 | 0.9995 | 0.9995 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9997 |
| 3.4 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9998 |
| 3.5 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 |
| 3.6 | 0.9998 | 0.9998 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.7 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.8 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.9 | 1.0000† | | | | | | | | | |

† For $z \geq 3.90$, the areas are 1.0000 to four decimal places.

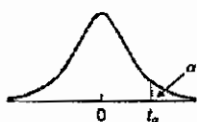


國立雲林科技大學
96 學年度碩士班入學招生考試試題

系所：工管所、資管系

科目：統計學

TABLE IV
Values of t_α



| df | $t_{0.10}$ | $t_{0.05}$ | $t_{0.025}$ | $t_{0.01}$ | $t_{0.005}$ | df |
|----|------------|------------|-------------|------------|-------------|----|
| 1 | 3.078 | 6.314 | 12.706 | 31.821 | 63.657 | 1 |
| 2 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 | 2 |
| 3 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 | 3 |
| 4 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 | 4 |
| 5 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 | 5 |
| 6 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 | 6 |
| 7 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 | 7 |
| 8 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 | 8 |
| 9 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 | 9 |
| 10 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 | 10 |
| 11 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 | 11 |
| 12 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 | 12 |
| 13 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 | 13 |
| 14 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 | 14 |
| 15 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 | 15 |
| 16 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 | 16 |
| 17 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 | 17 |
| 18 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 | 18 |
| 19 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 | 19 |
| 20 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 | 20 |
| 21 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 | 21 |
| 22 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 | 22 |
| 23 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 | 23 |
| 24 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 | 24 |
| 25 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 | 25 |
| 26 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 | 26 |
| 27 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 | 27 |
| 28 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 | 28 |
| 29 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 | 29 |
| 30 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 | 30 |
| 31 | 1.309 | 1.696 | 2.040 | 2.453 | 2.744 | 31 |
| 32 | 1.309 | 1.694 | 2.037 | 2.449 | 2.738 | 32 |
| 33 | 1.308 | 1.692 | 2.035 | 2.445 | 2.733 | 33 |
| 34 | 1.307 | 1.691 | 2.032 | 2.441 | 2.728 | 34 |
| 35 | 1.306 | 1.690 | 2.030 | 2.438 | 2.724 | 35 |
| 36 | 1.306 | 1.688 | 2.028 | 2.434 | 2.719 | 36 |
| 37 | 1.305 | 1.687 | 2.026 | 2.431 | 2.715 | 37 |
| 38 | 1.304 | 1.686 | 2.024 | 2.429 | 2.712 | 38 |
| 39 | 1.304 | 1.685 | 2.023 | 2.426 | 2.708 | 39 |
| 40 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 | 40 |
| 41 | 1.303 | 1.683 | 2.020 | 2.421 | 2.701 | 41 |
| 42 | 1.302 | 1.682 | 2.018 | 2.418 | 2.698 | 42 |
| 43 | 1.302 | 1.681 | 2.017 | 2.416 | 2.695 | 43 |
| 44 | 1.301 | 1.680 | 2.015 | 2.414 | 2.692 | 44 |
| 45 | 1.301 | 1.679 | 2.014 | 2.412 | 2.690 | 45 |
| 46 | 1.300 | 1.679 | 2.013 | 2.410 | 2.687 | 46 |
| 47 | 1.300 | 1.678 | 2.012 | 2.408 | 2.685 | 47 |
| 48 | 1.299 | 1.677 | 2.011 | 2.407 | 2.682 | 48 |
| 49 | 1.299 | 1.677 | 2.010 | 2.405 | 2.680 | 49 |


 TABLE VII (cont.)
 Values of χ^2_{α}

| $\chi^2_{0.10}$ | $\chi^2_{0.05}$ | $\chi^2_{0.025}$ | $\chi^2_{0.01}$ | $\chi^2_{0.005}$ | df |
|-----------------|-----------------|------------------|-----------------|------------------|-----|
| 2.706 | 3.841 | 5.024 | 6.635 | 7.879 | 1 |
| 4.605 | 5.991 | 7.378 | 9.210 | 10.597 | 2 |
| 6.251 | 7.815 | 9.348 | 11.345 | 12.838 | 3 |
| 7.779 | 9.488 | 11.143 | 13.277 | 14.860 | 4 |
| 9.236 | 11.070 | 12.833 | 15.086 | 16.750 | 5 |
| 10.645 | 12.592 | 14.449 | 16.812 | 18.548 | 6 |
| 12.017 | 14.067 | 16.013 | 18.475 | 20.278 | 7 |
| 13.362 | 15.507 | 17.535 | 20.090 | 21.955 | 8 |
| 14.684 | 16.919 | 19.023 | 21.666 | 23.589 | 9 |
| 15.987 | 18.307 | 20.483 | 23.209 | 25.188 | 10 |
| 17.275 | 19.675 | 21.920 | 24.725 | 26.757 | 11 |
| 18.549 | 21.026 | 23.337 | 26.217 | 28.300 | 12 |
| 19.812 | 22.362 | 24.736 | 27.688 | 29.819 | 13 |
| 21.064 | 23.685 | 26.119 | 29.141 | 31.319 | 14 |
| 22.307 | 24.996 | 27.488 | 30.578 | 32.801 | 15 |
| 23.542 | 26.296 | 28.845 | 32.000 | 34.267 | 16 |
| 24.769 | 27.587 | 30.191 | 33.409 | 35.718 | 17 |
| 25.989 | 28.869 | 31.526 | 34.805 | 37.156 | 18 |
| 27.204 | 30.143 | 32.852 | 36.191 | 38.582 | 19 |
| 28.412 | 31.410 | 34.170 | 37.566 | 39.997 | 20 |
| 29.615 | 32.671 | 35.479 | 38.932 | 41.401 | 21 |
| 30.813 | 33.924 | 36.781 | 40.290 | 42.796 | 22 |
| 32.007 | 35.172 | 38.076 | 41.638 | 44.181 | 23 |
| 33.196 | 36.415 | 39.364 | 42.980 | 45.559 | 24 |
| 34.382 | 37.653 | 40.647 | 44.314 | 46.928 | 25 |
| 35.563 | 38.885 | 41.923 | 45.642 | 48.290 | 26 |
| 36.741 | 40.113 | 43.195 | 46.963 | 49.645 | 27 |
| 37.916 | 41.337 | 44.461 | 48.278 | 50.994 | 28 |
| 39.087 | 42.557 | 45.722 | 49.588 | 52.336 | 29 |
| 40.256 | 43.773 | 46.979 | 50.892 | 53.672 | 30 |
| 51.805 | 55.759 | 59.342 | 63.691 | 66.767 | 40 |
| 63.167 | 67.505 | 71.420 | 76.154 | 79.490 | 50 |
| 74.397 | 79.082 | 83.298 | 88.381 | 91.955 | 60 |
| 85.527 | 90.531 | 95.023 | 100.424 | 104.213 | 70 |
| 96.578 | 101.879 | 106.628 | 112.328 | 116.320 | 80 |
| 107.565 | 113.145 | 118.135 | 124.115 | 128.296 | 90 |
| 118.499 | 124.343 | 129.563 | 135.811 | 140.177 | 100 |



國立雲林科技大學
96 學年度碩士班入學招生考試試題

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TABLE VIII (cont.)
Values of F_{α}

| dfd | α | dfn | | | | | | | | |
|-----|----------|-------|------|------|------|------|------|------|------|------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 17 | 0.10 | 3.03 | 2.64 | 2.44 | 2.31 | 2.22 | 2.15 | 2.10 | 2.06 | 2.03 |
| | 0.05 | 4.45 | 3.59 | 3.20 | 2.96 | 2.81 | 2.70 | 2.61 | 2.55 | 2.49 |
| | 0.025 | 6.04 | 4.62 | 4.01 | 3.66 | 3.44 | 3.28 | 3.16 | 3.06 | 2.98 |
| | 0.01 | 8.40 | 6.11 | 5.18 | 4.67 | 4.34 | 4.10 | 3.93 | 3.79 | 3.68 |
| | 0.005 | 10.38 | 7.35 | 6.16 | 5.50 | 5.07 | 4.78 | 4.56 | 4.39 | 4.25 |
| 18 | 0.10 | 3.01 | 2.62 | 2.42 | 2.29 | 2.20 | 2.13 | 2.08 | 2.04 | 2.00 |
| | 0.05 | 4.41 | 3.55 | 3.16 | 2.93 | 2.77 | 2.66 | 2.58 | 2.51 | 2.46 |
| | 0.025 | 5.98 | 4.56 | 3.95 | 3.61 | 3.38 | 3.22 | 3.10 | 3.01 | 2.93 |
| | 0.01 | 8.29 | 6.01 | 5.09 | 4.58 | 4.25 | 4.01 | 3.84 | 3.71 | 3.60 |
| | 0.005 | 10.22 | 7.21 | 6.03 | 5.37 | 4.96 | 4.66 | 4.44 | 4.28 | 4.14 |
| 19 | 0.10 | 2.99 | 2.61 | 2.40 | 2.27 | 2.18 | 2.11 | 2.06 | 2.02 | 1.98 |
| | 0.05 | 4.38 | 3.52 | 3.13 | 2.90 | 2.74 | 2.63 | 2.54 | 2.48 | 2.42 |
| | 0.025 | 5.92 | 4.51 | 3.90 | 3.56 | 3.33 | 3.17 | 3.05 | 2.96 | 2.88 |
| | 0.01 | 8.18 | 5.93 | 5.01 | 4.50 | 4.17 | 3.94 | 3.77 | 3.63 | 3.52 |
| | 0.005 | 10.07 | 7.09 | 5.92 | 5.27 | 4.85 | 4.56 | 4.34 | 4.18 | 4.04 |
| 20 | 0.10 | 2.97 | 2.59 | 2.38 | 2.25 | 2.16 | 2.09 | 2.04 | 2.00 | 1.96 |
| | 0.05 | 4.35 | 3.49 | 3.10 | 2.87 | 2.71 | 2.60 | 2.51 | 2.45 | 2.39 |
| | 0.025 | 5.87 | 4.46 | 3.86 | 3.51 | 3.29 | 3.13 | 3.01 | 2.91 | 2.84 |
| | 0.01 | 8.10 | 5.85 | 4.94 | 4.43 | 4.10 | 3.87 | 3.70 | 3.56 | 3.46 |
| | 0.005 | 9.94 | 6.99 | 5.82 | 5.17 | 4.76 | 4.47 | 4.26 | 4.09 | 3.96 |
| 21 | 0.10 | 2.96 | 2.57 | 2.36 | 2.23 | 2.14 | 2.08 | 2.02 | 1.98 | 1.95 |
| | 0.05 | 4.32 | 3.47 | 3.07 | 2.84 | 2.68 | 2.57 | 2.49 | 2.42 | 2.37 |
| | 0.025 | 5.83 | 4.42 | 3.82 | 3.48 | 3.25 | 3.09 | 2.97 | 2.87 | 2.80 |
| | 0.01 | 8.02 | 5.78 | 4.87 | 4.37 | 4.04 | 3.81 | 3.64 | 3.51 | 3.40 |
| | 0.005 | 9.83 | 6.89 | 5.73 | 5.09 | 4.68 | 4.39 | 4.18 | 4.01 | 3.88 |
| 22 | 0.10 | 2.95 | 2.56 | 2.35 | 2.22 | 2.13 | 2.06 | 2.01 | 1.97 | 1.93 |
| | 0.05 | 4.30 | 3.44 | 3.05 | 2.82 | 2.66 | 2.55 | 2.46 | 2.40 | 2.34 |
| | 0.025 | 5.79 | 4.38 | 3.78 | 3.44 | 3.22 | 3.05 | 2.93 | 2.84 | 2.76 |
| | 0.01 | 7.95 | 5.72 | 4.82 | 4.31 | 3.99 | 3.76 | 3.59 | 3.45 | 3.35 |
| | 0.005 | 9.73 | 6.81 | 5.65 | 5.02 | 4.61 | 4.32 | 4.11 | 3.94 | 3.81 |
| 23 | 0.10 | 2.94 | 2.55 | 2.34 | 2.21 | 2.11 | 2.05 | 1.99 | 1.95 | 1.92 |
| | 0.05 | 4.28 | 3.42 | 3.03 | 2.80 | 2.64 | 2.53 | 2.44 | 2.37 | 2.32 |
| | 0.025 | 5.75 | 4.35 | 3.75 | 3.41 | 3.18 | 3.02 | 2.90 | 2.81 | 2.73 |
| | 0.01 | 7.88 | 5.66 | 4.76 | 4.26 | 3.94 | 3.71 | 3.54 | 3.41 | 3.30 |
| | 0.005 | 9.63 | 6.73 | 5.58 | 4.95 | 4.54 | 4.26 | 4.05 | 3.88 | 3.75 |
| 24 | 0.10 | 2.93 | 2.54 | 2.33 | 2.19 | 2.10 | 2.04 | 1.98 | 1.94 | 1.91 |
| | 0.05 | 4.26 | 3.40 | 3.01 | 2.78 | 2.62 | 2.51 | 2.42 | 2.36 | 2.30 |
| | 0.025 | 5.72 | 4.32 | 3.72 | 3.38 | 3.15 | 2.99 | 2.87 | 2.78 | 2.70 |
| | 0.01 | 7.82 | 5.61 | 4.72 | 4.22 | 3.90 | 3.67 | 3.50 | 3.36 | 3.26 |
| | 0.005 | 9.55 | 6.66 | 5.52 | 4.89 | 4.49 | 4.20 | 3.99 | 3.83 | 3.69 |



● 問答題

1. Choose three or four conceptions from the followings and describe theoretically trust online? (20%) What's the future research may proceed in your structural model? (5%)
 - a. offline trust.
 - b. link type (advertisement or partnership) .
 - c. reputation of the linkee (link recipient) relative to linker.
 - d. expected sanctioning power.
 - e. word-of -mouth within social networks.
 - f. reputation of the linker.
 - g. perceived relationship between linker and linkee.
2. Please define open standard interorganizational systems (IOS) and describe two examples? (5%) What are the theoretical considerations for open standard IOS adoption? (20%)
3. Describe the new technology developments in the areas of networked computing; comment on the integration issues to the use of network computing; suggest one of the newest and most promising approaches to this problem. (15%)
4. Describe major categories of business intelligence; discuss the roles data warehouse, data mining, and OLAP play in business intelligence. (15%)
5. Compare and contrast utility computing, grid computing, and pervasive computing. (10%)
6. Explain how the communication and collaboration technologies can enhance the process of knowledge management. (10%)



本試題共 參 大題，共計 100 分，請依題號作答並將答案寫在答案卷上，違者不予計分。

一、是非題：20%（每題 2 分，請以 O、X 作答，答案請採橫式書寫，每行五題）

- () 1. 橋接器是在 OSI 參考模型的實體層、資料連結層及網路層運作，所以它能夠負責路由的工作。
- () 2. 10Base5 的“5”指的是網路的每個區段距離上限為 500 公尺。
- () 3. 10BaseF 網路因為使用光纖做為傳輸媒介，所以傳輸速率高達 100Mbps。
- () 4. DHTML 可以減少瀏覽器存取伺服器的次數。
- () 5. 電腦感染特洛伊木馬後，並不需要防毒軟體進行清除，直接刪除受感染的程式即可。
- () 6. 所謂軟體炸彈是在合法的程式執行完畢後，留在系統中的非法程式。
- () 7. 使用 2.4GHz 波段的缺點是可能與家用無線電話、微波爐等家電的電磁波產生干擾。
- () 8. 802.11b 採用的調變技術為 CCK。
- () 9. PC Card 原名為 PCMCIA Card，有 Type I、Type II 兩種類型。
- () 10. 橫向應用軟體通常是由大型的軟體公司根據市場大多數人的需求所設計出來的軟體，故能夠解決大多數人的問題。

【下頁尚有試題】



二、選擇題：50%（單選題，每題 2 分，答案請採橫式書寫，每行五題）

1. The P3P standard is concerned with:
 - (A). controlling pop-up ads based on user profiles and preventing ads from collecting or sending information.
 - (B). allowing users to surf the Web without being identified.
 - (C). scrambling data so that it can't be read.
 - (D). blocking or limiting cookies.
2. The use of computers to combine data from multiple sources and creating electronic dossiers of detailed information on individuals is called:
 - (A). profiling.
 - (B). invasion.
 - (C). spamming
 - (D). safe harbor
3. Software in a multi-tiered network that provides the business logic for handling all application operations between a user and an organization's back-end business systems best describes:
 - (A). Web server.
 - (B). application server.
 - (C). groupware.
 - (D). capacity server.
4. A high-speed network dedicated to storage that connects different kinds of storage devices, such as tape libraries and disk arrays so they can be shared by multiple servers best describes:
 - (A). SSN.
 - (B). RAID.
 - (C). Blade server.
 - (D). SAN.

【下頁尚有試題】



5. When a firm purchases computing power from a central computing service and pays only for the amount of computing power it uses, this is commonly referred to as:
- (A). grid computing. (B). utility computing.
(C). edge computing. (D). autonomic computing.
6. An industry-wide effort to develop systems that can configure, optimize, tune, and heal themselves when broken, and protect themselves from outside intruders and self-destruction is called:
- (A). grid computing. (B). utility computing.
(C). edge computing. (D). autonomic computing.
7. EV-DO provides wireless access to the Internet over a cellular network at an average speed of:
- (A). 10 – 19 Kbps. (B). 54 – 144 Kbps.
(C). 144 Kbps – 2+ Mbps. (D). 300 – 500 Kbps.
8. When users move from wireless hotspot to wireless hotspot to gain network or Internet access, it is sometimes referred to as:
- (A). nomadic computing. (B). itinerant computing.
(C). roam computing. (D). travel computing.
9. In a RFID system, a(n) _____ is electronically programmed with information that can uniquely identify an item, such as an electronic code.
- (A). reader (B). antenna
(C). microchip (D). transponder



10. Atop 802.15.4 is the _____ protocol, which handles application-level communication between devices.
- (A). ZigBee (B). TinyBee
(C). BigBee (D). ZagBee
11. 下列敘述何者為非？
- (A). 迴圈架構與階層架構均屬於點對點拓樸
(B). 點對點拓樸中若只是一部電腦當機並不會影響整個網路的運作
(C). 匯流排架構是屬於廣播拓樸
(D). 星狀拓樸需要使用到集線器
12. 軟體再造工程的哪個步驟產生新的結構化程式碼？
- (A). 逆向工程 (B). 修正規格
(C). 前向工程 (D). 後向工程
13. CSMA/CD 屬於 OSI 參考模型的哪個層次？
- (A). 網路層 (B). 表達層
(C). 傳輸層 (D). 資料連結層
14. 下列何者可以協助知識工作者發掘新知識，以創新產品與服務？
- (A). TPS (B). KWS
(C). MIS (D). Office System
15. 下列何者不屬於資料倉儲的三大應用？
- (A). Data Mining (B). Web Mining
(C). DSS (D). MIS



16. 下列何者屬於物件導向式資料庫？
- (A). SQL Server (B). Objectivity
(C). Sybase (D). Visual Foxpro
17. 下列何者可以定義網頁資料的編排格式，彌補 HTML 的不足？
- (A). XML (B). CSS
(C). DHTML (D). VRML
18. 在瞬間發送大量的網路封包，以癱瘓被攻擊者的網站及伺服器，我們稱之為何？
- (A). 特洛伊木馬 (B). 軟體炸彈
(C). 惡性程式 (D). 拒絕服務攻擊
19. 下列何者關於 SET 與 SSL 的比較，何者錯誤？
- (A). SET 的安全性比 SSL 低
(B). SET 可以驗證付款授權，但 SSL 則無此功能
(C). SET 的每筆交易需支付手續費，但 SSL 則無
(D). SET 是由 Visa、Mastercard 等公司所提出，而 SSL 是由 Netscape 公司所提出
20. 下列何者為虛擬私人網路所採用的通道標準？
- (A). PPTN (B). NNTP
(C). SNMP (D). POP
21. 在 Class A、B、C 網路中，若要表示廣播至整個網路，IP 位址的主機編號為何？
- (A). 0 (B). 63
(C). 127 (D). 255



22. 下列何者不是區域網路標準？
- (A). ISDN (B). Ethernet
(C). FDDI (D). Token Ring
23. 下列何種磁碟陣列的組織方式會使用備份磁碟？
- (A). 等量分配 (B). 雜湊
(C). 鏡射 (D). 階層分配
24. 下列關於 UWB 的敘述何者錯誤？
- (A). 使用特定窄頻 (B). 又稱為隱形波
(C). 屬於高速無線通訊技術 (D). 傳輸方式為脈衝方式
25. 下列何者可以下載整個網站？
- (A). Teleport Pro (B). Getright
(C). AntiVirus (D). Outlook

三、問答題：30%

1. 請說明 Web Services 的四大基本技術。(12%)
2. 請說明一套完善的 Disaster Recovery Plan 應包含那些部分(或步驟)? (12%)
3. 有一數列 {9、13、8、14、7} 請利用選擇排序法 (selection sort) 完成遞增排序，請說明排序過程與結果。(6%)

【 試題結束 】



第一部分 (單選題，每題 2 分，共 50 分)

1. 下列那一種無線傳輸方式每秒的傳輸量最大？
(A) UWB (B) Bluetooth (C) 802.11a (D) 802.11b
2. 下列哪一個 IP 位址可以在網際網路(Internet)上使用？
(A) 10.38.2.1 (B) 192.168.0.10 (C) 127.0.0.1 (D) 38.2.4.6
3. 下列何者不是 Process Synchronization 的機制？
(A) Socket (B) Monitor (C) Semaphore (D) Critical Region
4. 在微軟的 Visual Studio 環境中，下列何者不可以用來開發 Web-Based 程式？
(A) C# (B) C++ (C) VB (D) J#
5. 下列哪一項技術主要是在瀏覽器(Web Browser)中執行的？
(A) PHP (B) JSP (C) Ajax (D) MVC
6. 下列哪一種軟體最適合開發 3D 遊戲？
(A) Flash (B) Delphi (C) Virtools (D) Illustrator
7. 在 Internet 的網路架構中，下列哪一層是使用 OSI 標準架構的？
(A) 連結層(Data Link Layer) (B) 網路層(Internet Layer)
(C) 傳輸層(Transport Layer) (D) 應用層(Application Layer)
8. 下列何者不是 RFID 系統主要的組成元件？
(A) 電子標籤(Tag) (B) 感應器(Reader)
(C) 天線(Antenna) (D) 處理器(Processor)
9. 在 UML(Unified Modeling Language)中，下列哪一種圖可以用來表達物件間的互動行為呢？
(A) 類別圖(Class Diagram) (B) 合作圖(Collaboration Diagram)
(C) 元件圖(Component Diagram) (D) 狀態圖(State Diagram)
10. 假設某區域網路的 IP 位址為 199.200.18.66~199.200.18.90 間，試問其子網路罩(Mask)應該設為多少呢？
(A) 255.255.255.128 (B) 255.255.255.192
(C) 255.255.255.224 (D) 255.255.255.240
11. 在物件導向塑模中，下列哪一項不是類別間重要的關係？
(A) 獨立(Independency) (B) 關聯(Association)
(C) 組合(Aggregation) (D) 一般化(Generalization)
12. 下列哪一種處理器排班(Process Scheduling)策略可以是 Preemptive 也可以是 Nonpreemptive 的？
(A) Priority (B) FCFS(Fist Come Fist Served)
(C) RR(Round Robin) (D) SJF(Shortest Job First)



13. 下列何者不是防火牆管制封包進出的措施？
 (A) 封包過濾(Packet Filtering) (B) 入侵偵測(Intrusion Detection)
 (C) 網路位址轉譯(NAT) (D) 代理機制(Proxy Server)
14. ping 程式主要使用下列哪一種通訊協定呢？
 (A) SAP (Session Announcement Protocol)
 (B) ICMP (Internet Control Message Protocol)
 (C) LDAP (Lightweight Directory Access Protocol)
 (D) SNMP (Simple Network Management Protocol)
15. 下列有關基頻(Baseband)與寬頻(Broadband)的敘述，何者不正確？
 (A) 基頻與寬頻取決於使用傳輸媒體的種類
 (B) 寬頻網路同一時間能傳輸文字、聲音與視訊等資料
 (C) 寬頻網路可以提供遠距教學、虛擬實境與線上遊戲等服務
 (D) 有線電視網路(Cable Network)與非對稱用戶迴路(ASDL)都屬於寬頻網路
16. 下列有關 Web-Based 程式設計的敘述，何者不正確？
 (A) Session 可以用來管理使用者的連線
 (B) Java 語言可以用來設計 Web-Based 程式
 (C) Cookies 可以用來將使用者資料寫在使用者的電腦上
 (D) 表單中的隱藏(Hidden)欄位可以用來傳遞瀏覽器與伺服器間的資料
17. 下列有關維基百科(Wiki)的敘述，何者不正確？
 (A) Wiki 上需要有使用權限才可以進行編輯的工作
 (B) Wiki 除了被用來建立網站外也被用作編寫網誌
 (C) Wiki 在一些需要內容管理系統的企業中得到了廣泛應用
 (D) Wiki 是一種可在網路上開放多人協同創作的超文本系統
18. 下列有關語義網(Semantic Web)的敘述，何者不正確？
 (A) OWL 是一種用於描述語義網上本體論關係的語言
 (B) 語義網是一種新的網路內容形式能讓電腦理解其中的語意
 (C) 語義網是由發明網際網路全球資訊網(WWW)的人所提出的
 (D) 都柏林核心集(Dublin Core)是 W3C 所制定與語義網有關的標準
19. 下列 C 語言片段程式執行後，何者正確？

```

int a, b;
a = 1; b = 0;
if ((a=0) | (b=1))
  b = 3;
else
  a = 4;

```

 (A) a=1 (B) a = 4; (C) b = 0 (D) b = 3
20. 下列 C++ 語言片段程式執行後，何者正確？



```
int a, b, *c=&a, &d=b;
a = 1; b = 2; *c = d + b; d = a + *c;
```

- (A) 程式不能執行 (B) a = 4 (C) b = 4 (D) d = 5

21. 下列有關 C++ 語言定義 book 類別的敘述，何者正確？

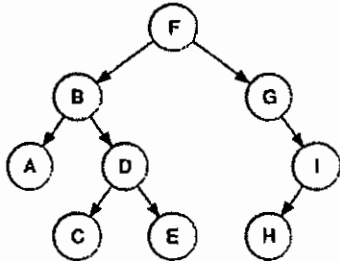
```
class book
{
    public: string name;
           int get_price(int price1)
           {
               price = price1;
           }
    private: float price;
    protected: int no;
} book1;
```

- (A) book 類別有定義建構函數 (B) 可以設定 book1 的 no 值
 (C) 可以設定 book1 的 name 值 (D) 可以取得 book1 的 price 值
22. 某個二元樹其前序式 (PreOrder) 為 ABCDEFGH，中序式 (Inorder) 為 CBAFEDHG，下列哪一個是它的後序式 (Postorder) 呢？
 (A) BCFEGHDA (B) BCEFHGDA (C) CBFEGHDA (D) CBFEGHDA
23. 假設某程式的執行時間可用關係式 $F(n) = 2 \times F(n-1) + 1$ ， $n > 1$ ， $F(1) = 1$ 來表示，試問此程式的時間複雜度為何？(n 為資料總筆數)
 (A) $O(1)$ (B) $O(n)$ (C) $O(n^2)$ (D) $O(2^n)$
24. 假設 GCD 為利用遞迴 (Recursion) 方式計算某兩個數最大公約數的函數， $GCD(127, 36)$ 要再呼叫 GCD 幾次才可以得到答案呢？
 (A) 3 次 (B) 4 次 (C) 5 次 (D) 6 次
25. 假設某雜湊存取 (hashing) 之雜湊函數為 $h(x) = x \bmod 5$ ，每個桶間 (bucket) 可以存放 3 筆資料，並以鏈結法 (chaining) 解決碰撞問題，若將 42、57、16、52、66、77、12、25、21、33、32、14，共 12 筆資料，依序新增進入一個空的雜湊檔，則共需多少個桶間呢？
 (A) 4 (B) 5 (C) 6 (D) 7



第二部分 (單選題, 每題 2 分, 共 50 分)

1. Given the following binary search tree, which one of the following sequences will the post-order traversal yields?



- (A) F, B, A, D, C, E, G, I, H (B) A, C, E, D, B, H, I, G, F
(C) A, B, C, D, E, F, G, H, I (D) F, B, G, A, D, I, C, E, H

2. An unrolled linked list is a variation on the linked list which stores multiple elements in each node. A typical unrolled linked list node looks like this:

```

record node {
    node next // reference to next node in list
    int numElements // number of elements in this node, up to maxElements
    array elements // an array of numElements elements, with space
                  // allocated for maxElements elements
}
  
```

To insert a new element, we simply find the node the element should be in and insert the element into the elements array, incrementing numElements. If the array is already full, we first insert a new node either preceding or following the current one and move half of the elements in the current node into it.

To remove an element, similarly, we simply find the node it is in and delete it from the elements array, decrementing numElements. If numElements falls below $\text{maxElements} \div 2$ then we pull elements from adjacent nodes to fill it back up to this level. If both adjacent nodes are too low, we combine it with one adjacent node and then move some values into the other.

Which one of the following statements about unrolled linked lists is *false*?

- (A) Unrolled linked lists hurt the quick insert/deletion advantages of ordinary linked lists.
(B) When indexing into unrolled linked list, we can progress a node at a time rather than an element at a time, reducing the indexing time significantly.
(C) Unrolled linked lists perform sequential traversal much more rapidly, due to less cache misses.
(D) Unrolled linked lists increase storage requirements.
3. What is the name of a queue-like abstract data structure for which elements can be added to or removed from the front or back?
(A) deque (B) priority queue (C) multimap (D) associative array
4. Which one of the following statements about Dijkstra's algorithm is *false*?
(A) Dijkstra's algorithm is a greedy algorithm.
(B) Dijkstra's algorithm solves the single-source shortest path problem for a directed graph.
(C) Dijkstra's algorithm can be used on graphs with negative edge weights.
(D) OSPF (open shortest path first) is a well known real-world implementation of



Dijkstra's algorithm used in internet routing.

5. In strict evaluation, the arguments to a function are always evaluated completely before the function is applied. Which one of the following is *not* a strict evaluation strategy?

| | |
|-----------------------|--------------------------|
| (A) call by name | (B) call by value |
| (C) call by reference | (D) call by copy-restore |
6. Which one of the following statements about algorithms is *false*?
 - (A) When a problem shows optimal substructure and overlapping subproblems, dynamic programming avoids recomputating solutions that have already been computed.
 - (B) The general purpose of heuristic algorithms is to find an optimal solution when the time or resources are limited.
 - (C) Reduction is a technique in solving many problems by transforming one problem into another problem.
 - (D) Probabilistic algorithms are those that make some choices randomly (or pseudo-randomly).
7. Most programming languages with control structures have an initial keyword which indicates the type of control structure involved. Which one of the following languages has a final keyword for its control structures?

| | | | |
|-------|----------|----------|------------------|
| (A) C | (B) Java | (C) Perl | (D) Visual Basic |
|-------|----------|----------|------------------|
8. Which one of the following concepts provides modularity and structure in an object-oriented computer program?

| | |
|-----------------|------------------|
| (A) inheritance | (B) method |
| (C) class | (D) polymorphism |
9. An interface defines the communication boundary between two entities. Which one of the following programming languages does *not* provide specific interface constructs?

| | | | |
|-------|------------|----------|------------------|
| (A) C | (B) Delphi | (C) Java | (D) Visual Basic |
|-------|------------|----------|------------------|
10. Which one of the following statements about object composition is true?
 - (A) In composition, the composite type "is an" instance of a simpler type.
 - (B) In UML, composition is depicted as an open diamond and a solid line.
 - (C) In composition, when the owning object is destroyed, the contained objects continue to exist.
 - (D) Objects can be composed recursively with the use of recursive types or references.
11. Which one of the following sorting algorithms has the best worst-case timing complexity?

| | |
|----------------|----------------------|
| (A) quicksort | (B) selection sort |
| (C) merge sort | (D) binary tree sort |
12. Which one of the following SQL queries will retrieve the top-10 highest-salary employees?

| |
|---|
| (A) <code>SELECT *</code> <code>FROM employee</code> |
|---|



```
ORDER BY salary
HAVING COUNT(*) <= 10;
```

- (B) SELECT *
 FROM (SELECT ROW_NUMBER() OVER (ORDER BY salary DESC)
 AS rows, id, name, salary
 FROM employee) AS x
 WHERE rows <= 10;
- (C) SELECT *
 FROM employee
 WHERE salary >= (SELECT AVG(salary)
 FROM employee);
- (D) SELECT *
 FROM employee
 GROUP BY salary
 HAVING COUNT(*) <= 10;
13. Which one of the following is *not* a fundamental algorithm to perform a join operation in a relational database?
 (A) nested loops (B) hash join
 (C) merge join (D) cross join
14. Which one of the following refers to the ability of a DBMS to guarantee that either all of the tasks of a transaction are performed or none of them is?
 (A) atomicity (B) consistency
 (C) durability (D) isolation
15. Which one of the following is the term that refers to an attribute or set of attributes that uniquely identifies rows within a table of a relational database?
 (A) primary key (B) candidate key
 (C) superkey (D) foreign key
16. Which one of the following is a unary operator in relational algebra?
 (A) join (B) projection
 (C) set union (D) Cartesian product
17. Which one of the following is *not* a defining feature of a data warehouse?
 (A) subject-oriented (B) time-variant
 (C) volatile (D) integrated
18. Which one of the following phases in a data warehouse is most likely to contain the activity of joining together data from multiple sources?
 (A) extract (B) transform
 (C) load (D) build
19. Which one of the following phases precedes the conceptual design phase in the life cycle of a relational database?
 (A) requirements gathering (B) logical design
 (C) conceptual design (D) testing
20. Which one of the following *cannot* be used to define XML schemas?
 (A) Document Type Definition (B) RELAX NG
 (C) Schematron (D) XML Base

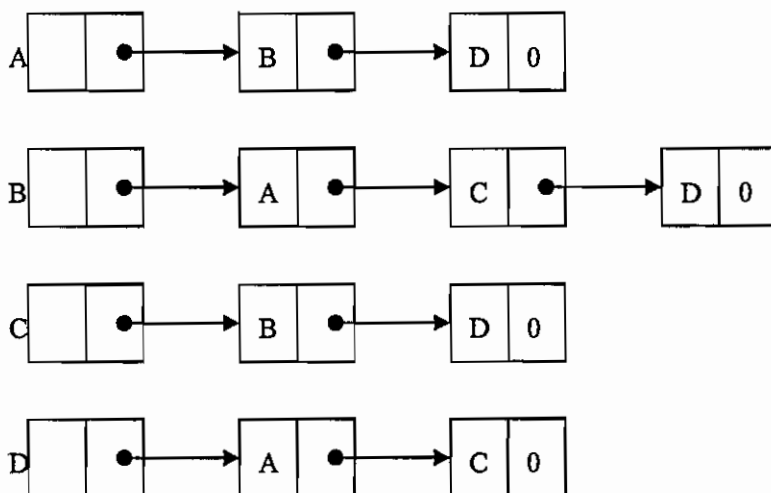


21. Which one of the following is used for attribute selection in XPath?
(A) .. (B) // (C) | (D) @
22. Which one of the following statements about XSLT is true?
(A) XSLT is an XML markup language for document formatting which is most often used to generate PDFs.
(B) The XSLT language is declarative.
(C) XSLT processing occurs only at the server-side.
(D) XSLT is the foundation of XPath.
23. Which one of the following statements about SOA (service-oriented architecture) is true?
(A) Web services standards is the foundation of SOA.
(B) SOA-based systems must be implemented with Java technologies.
(C) One of the guiding principles of SOA is loose coupling.
(D) HTTP (or HTTPS) is the standard request/response protocol between clients and servers in SOA.
24. Which one of the following is *not* a design goal of BPEL (Business Process Execution Language)?
(A) Provide a standard graphical notation for process modeling.
(B) Define business processes using an XML based language.
(C) Provide data manipulation functions for the simple manipulation of data needed to define process data and control flow.
(D) Use Web Services as the model for process decomposition and assembly.
25. Which one of the following statements about WSDL (Web Services Description Language) is *false*?
(A) WSDL is an XML-based language.
(B) WSDL provides a model for describing Web services.
(C) WSDL uses concrete protocols to define ports.
(D) WSDL is often used in combination with SOAP and XML Schema to provide web services over the Internet.



本試題共七題，每提配分都已經分別註明，共計 100 分，請依題號作答並將演算過程及答案寫在答案卷上，違者不予計分。

- 利用陣列(array)資料結構實現一個佇列(queue)，寫出將一筆資料 x 加入佇列 Q 的演算法虛擬碼(pseudo code) ENQUEUE(Q, x)，此演算法必須能偵測佇列是否會滿載(overflow). (10 分)
- (a) 請定義何謂二元搜尋樹。注意：須以嚴謹詳細的方式定義。
(b) 請先說明如何在二元搜尋樹中找出最大值，再寫出該演算法的虛擬碼(pseudo code). (20 分)
- 請自行設計一個例子詳細說明雜湊法(hashing)之運作。具體而言，自行設計一串數列與雜湊函數說明該數列如何存入儲存空間，以及如何搜尋某筆資料。所設計的數列必須包含有多個碰撞的案例，要儲存的數值產生碰撞時，如何處理？要搜尋的數值為碰撞數值時，如何搜尋。假設碰撞的解決方案採用二次方探索法(quadratic probing). (20 分)
- 下圖為無向圖 G 的相鄰串列表示法，請繪出該無向圖 G (10 分)



- 某二元樹的中序走訪(Inorder Traversal)為 BAFDGCE，後序走訪(Postorder Traversal)為 BFGDECA，請繪出此二元樹。(10 分)



● 問答題

1. (1)什麼是資訊系統(IS)? 5%
(2)資訊系統(IS)所使用的資訊科技包括那四種科技? 5%
(3)資訊系統(IS)架構主要強調那五個領域的知識? 5%
2. 請舉一實際的大企業來說明該公司的資訊科技競爭策略。
說明時一定要用五種競爭策略(低成本、差異、創新、成長、聯盟)與麥可·波特(Michael E. Porter)五個競爭力(五力分析)的相關議題來加以分析說明。15%
3. (1)如何評估資訊系統? 5%
(2)若以資訊品質、系統品質與服務品質三個構面來作為評估資訊系統的指導方針，你會如何來加以擴大應用與實作一評估系統呢? 15%
4. 請討論資訊科技(IT)在當代企業中所扮演的角色，主要為策略性武器(Strategic Weapon)或生存工具(Survival Tool)? 請建議如何從 IT 投資中有效提昇企業的生產力。10%
5. 請分析電子商務(Electronic Commerce; EC)主要的失敗理由，並建議改善成功機率的策略。10%
6. 請描述可有效支援跨組織資訊系統(Inter-Organizational Information Systems; IOSs)的主要資訊科技。10%
7. 請定義供應鏈管理(Supply Chain Management; SCM)的主要活動與成員，有人認為供應鏈管理的對象，資訊的比重勝過貨品的實體移動，請說明您的看法。10%
8. 請簡介三種數位化公司常用的「應用系統開發」(Application Development)工具。10%



- 一、試論批判教育學 (critical pedagogy) 及其對教師教學的啟發。(25%)
- 二、試從族群關係、兩性關係與社會關係，探討多元文化教育的意義及其在課程設計的理念。(25%)
- 三、教育部長杜正勝在接受專訪時指出：「為落實國民教育的精神，也為了提昇國家人力素質，教育部多年來一直致力於推動教育普及化及延長國民教育」，行政院於今年二月份正式宣布推動十二年國民基本教育方案，然此政策之推動亦引發許多討論與爭議，您認為此項政策之主要爭議點有哪些？並請依據教育之相關原理、原則來評析這些爭議點？〈25%〉
- 四、「假如學生不能用我們教他們的方式學習，我們就必須用他們學習的方式去教他們」。教育部大力推動「零體罰」，主張以有效的輔導代替懲罰，但教育現場體罰事件爭議仍舊存在，你如何從學習的角度來分析體罰在教育上的意涵與影響？〈25%〉